The University of Alberta

81-82 calendar

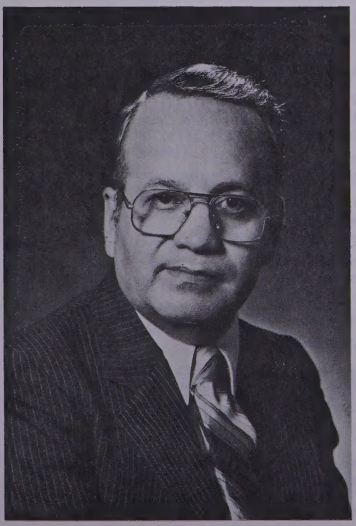
Past Presidents of The University of Alberta

Back Cover

Robert Newton *1941-1950*	Andrew Stewart *1950-1959*
Robert Charles Wallace *1928-1936*	Max Wyman *1969-1974*

Front Cover

Walter Hugh Johns *1959-1969*	William Alexander Robb Kerr *1936-1941*
Harry Emmet Gunning *1974-1979*	Henry Marshall Tory *1908-1928*



Myer Horowitz, President

Please Note

(1) Each student is responsible for the completeness and accuracy of his or her registration. Please read the calendar carefully and, if you are in doubt about the regulations pertaining to your program, consult the appropriate University official. (See item 7 below.)

(2) Please use this calendar when you register. The University cannot supply more than one copy to each student.

(3) The calendar sets forth the intention of the University at the time of its publication, with respect to all matters contained therein. The University reserves the right at any time to deviate from what appears in the calendar, either in order to serve the best interests of the University, or because of circumstances or occurrences beyond the University's reasonable control. The University expressly denies responsibility or liability to any person or persons who may suffer loss or who may be otherwise adversely affected by such change.

(4) The office hours of the University are from 8:30 a.m. to 12 noon and from 1:00 p.m. to 4:30 p.m. Monday to Friday (except holidays); in May, June, July, and August the office hours are basically from 8:00 a.m. to 4:00 p.m. with lunch from either 11:30 a.m. to 12:30 p.m. or 12:00 p.m. to 1:00 p.m. Telephone number: 432-3111 (area code 403).

(5) Professional Requirements: Any student or prospective student intending to enter a profession following graduation should get in touch with the appropriate faculty office in order to ascertain what requirements there are for professional registration above and beyond possession of the prescribed university degree or diploma. In some cases this information is provided in the faculty calendar.

(6) The following deadlines should be noted:

Applications— D.D.S. Program, February 2, 1981
LL.B. Program, February 27, 1981
B.F.A. Program (Drama), April 1, 1981
B.F.A. Program (Art & Design), May 1, 1981
Rehabilitation Medicine, May 1, 1981
Nursing, May 15, 1981
B.Ed. and B.Ed. / A.D. Programs, June 1, 1981
Dental Hygiene, Feb. 2, 1981
Other undergraduate programs, July 2, 1981
M.D. Program, November 2, 1981 (for admission to 1982-83 Session)
M.D. Program, November 1, 1982 (for admission to 1983-84 Session)

Other deadlines are set out in the Academic Schedule (see § 11).

(7) Inquiries should be directed as follows:
(All addresses should contain the suffix: University of Alberta, Edmonton, Alberta, T6G 2E2.)

On academic matters: The Dean of the appropriate faculty.

On admission of Canadian students, registration, records, transcripts, Convocation:
Office of the Registrar, 2nd Floor, Administration Building (432-3113).

On examinations and foreign admissions: Office of the Registrar,
1st Floor, Administration Building (432-5221 or 432-4981 respectively).

On change of faculty, interest and aptitude tests, personal problems, unsatisfactory standing, vocation planning, withdrawal from the University:
Student Counselling Services, 102 Athabasca Hall (432-5205).

On financial assistance, scholarships and awards:
Administrator of Student Awards, 252 Athabasca Hall (432-3495).

On University residence and other housing:
Director, Housing and Food Services, 44 Lister Hall (432-4281).

On student affairs: Dean of Students, Office of Student Services,
234 Athabasca Hall (432-2969).

On native affairs: Office of the Adviser on Native Affairs, 124 Athabasca Hall (432-5677).

On fee payments: Office of the Comptroller, 3rd Floor, Administration Building (432-3204).

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University Regulations and Information for Students

11 ACADEMIC SCHEDULE 1981-82

A DETAILED ACADEMIC SCHEDULE FOR THE SPRING SESSION (MAY-JUNE) AND SUMMER SESSION (JULY-AUGUST) APPEARS IN THE SPECIAL SESSIONS CALENDAR. ALL DEADLINES IN THE ACADEMIC SCHEDULE ARE MARKED BY THE ■ SYMBOL.

11.1 July, 1981

Wednesday, 1

Seventy-fifth University year begins.

Statutory holiday; University buildings closed.

Thursday, 2

■ Last day for receiving applications for admission in the 1981-82 Session to all undergraduate programs except the following programs which have earlier deadlines: M.D. (November 3, 1980); D.D.S. and Dental Hygiene (February 2, 1981); LL.B. (February 27, 1981); B.F.A. Drama (April 1, 1981); B.F.A. Art and Design and Rehabilitation Medicine (May 1, 1981); B.Sc. in Nursing Basic and Post-basic programs (May 15, 1981): B.Ed. and B.Ed. A.D. (June 1, 1981); B.Sc. in Engineering applicants who have previously attended post-secondary institutions (June 15, 1981).

■ Last day for submission of all forms and supporting documents for transfer or admission to the Faculty of Business Administration and Commerce by University of Alberta students and by students who have attended other post-secondary institutions.

Friday, 3

■ Last day for receiving applications for regular supplemental and deferred final examinations granted by faculties.

Monday, 6

Six week Summer Session begins.

Wednesday, 15

■ Last day for students who have been required to withdraw to notify the Student Counselling Services that they are seeking re-admission.

■ Last day for applications for degrees in Business Administration and Commerce, Education, Home Economics, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, and Science to be conferred at Fall Convocation.

11.2 August, 1981

Monday, 3

Heritage Day; University buildings closed.

Tuesday, 4

■ Last day for students who plan to register in September 1981 in an applied music course in voice or instrument to apply to the Department of Music for an audition.

Tuesday, 4 to Saturday, 8

Regular supplemental examinations, except for students in the LL.B. program (June 15 to 19, 1981).

Wednesday, 12

■ Last day for advance registration in on-campus late afternoon and evening credit courses, except in B.Ed. program (See June 1, 1981). New students must have applied for admission by July 2, 1981.

Friday, 14

■ Last day for submitting re-enrolment forms to the Faculty of Arts by students previously registered in another faculty and wishing to transfer in September.

Monday, 24

Orientation day for mature students.

Monday, 24 to Friday, 28

■ Last week for securing departmental approval of Graduate Program forms.

Tuesday, 25 to Friday, 28

Orientation week for foreign students.

Orientation exercises for students in first year of LL.B. program.

Monday, 31

Orientation day for Mature Students.

11.3 September, 1981

Tuesday, 1

Orientation begins for students in Dentistry.

Classes begin in first, second and third years of the LL.B. program, and in first and second years of the M.D. program.

Advance registrants pick-up class timetables and I.D. cards.

Wednesday, 2

9 A.M. Registration and beginning of orientation exercises for students in Dental Hygiene.

Wednesday, 2 to Friday, 4

In-person registration (in accordance with the published schedule) of all new students except in Dentistry, Dental Hygiene, Law, and Medicine, and of former and continuing students who have not advance registered.

Saturday, 5

Special supplemental examinations.

Monday, 7

Labor Day; University buildings closed.

Tuesday, 8

Classes begin for remaining students.

■ Last day for registration or for course or course section changes in First Term and full session courses by students in Law.

Thursday, 17

■ Last day for registration or for course or course section changes, or for changing from "audit" to "credit" in first term and full session courses by undergraduate students, except in Law (see Sept. 8).

Friday, 18

■ Last day for adding First Term and full session courses to registrations in the Faculty of Graduate Studies and Research.

Friday, 25

■ Last day for withdrawal from courses in Dentistry and Dental Hygiene.

Wednesday, 30

■ Last day for payment of undergraduate fees without penalty. (See Regulations § 15.2.)

■ Last day to apply for degrees in Arts to be conferred at Fall Convocation.

11.4 October, 1981

Thursday, 1

■ Last day for non-matriculated adults to apply for admission in the Second Term to the Faculty of Arts.

Monday, 12

Thanksgiving Day; University buildings closed.

Thursday, 15

Registrations of undergraduate students who have not paid at least the first installment of their fees by this date will be subject to cancellation. (See Regulations § 15.2.)

Friday, 16

■ Last day for submission of unbound theses and Notices of Completion of Non-Thesis Programs to the Faculty of Graduate Studies and Research to ensure graduation at Fall Convocation.

Monday, 19

■ Last day for dropping First Term courses or changing from "credit" to "audit" or "audit" to "credit" in First Term courses in the Faculty of Graduate Studies and Research.

Monday, 19 to Friday, 23

Mid-term Test Week. Off-campus University organized extra-curricular activities will not normally be allowed during this week.

Wednesday, 28

■ Last day for withdrawing from First-Term courses or for changing from "credit" to "audit" in First Term courses by students in the Faculty of Law.

11.5 November, 1981

Monday, 2

■ Last day for receiving applications for admission to the M.D. program in the 1982-83 Session.

■ Last day for submitting applications for admission or re-enrolment to the Second Term, complete with all supporting documents, to the Faculty of Education.

Friday, 6

■ Notice of intention regarding attendance at Fall Convocation must be given by 4:30 p.m.

Wednesday, 11

Remembrance Day; University buildings closed.

Thursday, 12

■ Last day for withdrawing from First Term courses, or changing from "credit" to "audit" in First Term courses by students in the Faculties of Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculté Saint-Jean and Science.

Saturday, 21

Fall Convocation.

11.6 December, 1981

Tuesday, 1

■ Last day for receiving applications for admission to programs commencing in the Second Term except in the Faculty of Education (See Nov. 2).

■ Last day for students in good standing in another faculty to re-enrol in the Second Term in the Faculty of Arts.

■ Last day for submission of applications for admission to Post-graduate Diploma in Dentistry program in the 1982-83 Session.

Friday, 4

■ Last day for First Term classes in Law.

Monday, 7

■ Last day of classes in First Term, except students in Dentistry and Medicine (see December 18).

Wednesday, 9 to Saturday, 19

Mid-session examinations for students in the Faculty of Law will be held within this period.

**Monday, 14 to Friday, 18*

Mid-session Examinations. Off-campus University organized extra-curricular activities will not normally be allowed during this period.

**Mid-session or Final Examinations (IF ANY) for all on-campus courses offered at 1700 hours or later, are to be held during the last regular class period.*

Tuesday, 15

■ Last day to apply for degrees in Arts to be conferred at Spring Convocation.

Friday, 18

■ Last day of First Term classes and examinations in Dentistry and Medicine.

Saturday, 19

Christmas vacation begins.

11.7 January, 1982

Monday, 4

8 a.m. Second Term classes begin.

Four week clinical session begins for students in Advanced Practical Obstetrics (Nursing).

Monday, 11

■ Last day for registration, or for course or course section changes in Second Term courses, or for changing from "audit" to "credit" by undergraduate students.

Tuesday, 12

■ Last day for withdrawing from full-session courses or for changing from "credit" to "audit" in full-session courses by students in the Faculty of Law.

Friday, 15

■ Last day for payment without penalty of second installment of fees, or of fees assessed for students attending only in Second Term. (See Regulations § 15.2).

Thursday, 28

■ Last day for adding Second Term courses to registration in the Faculty of Graduate Studies and Research.

11.8 February, 1982

Monday, 1

■ Last day for application for degrees in Business Administration and Commerce, Education, Home Economics, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation

Medicine, and Science to be conferred at Spring Convocation.

Registrations of students who have not paid second installment of fees or Second Term fees by this date are subject to cancellation (See Regulations § 15.2).

Tuesday, 2

■ Last day for applications for admission to the undergraduate Dentistry and Dental Hygiene programs.

Wednesday, 3

12 noon to 1 p.m. Students' Union Election Rally. Classes withdrawn for this hour.

Friday, 12

■ Last day for withdrawing from full-session courses or for changing from "credit" to "audit" in full-session courses by students in the following faculties: Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Library Science, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculté Saint-Jean, and Science.

Monday, 15

■ Last day for dropping Second Term courses or full-session courses, or changing from "credit" to "audit" or "audit" to "credit" in Second Term or full-session courses in the Faculty of Graduate Studies and Research.

Monday, 15 to Friday, 19

Mid-term Test Week. Off-campus University organized extra-curricular activities will not normally be allowed during this week.

Monday, 22 to Sunday, 28

Second Term Reading Week; classes withdrawn for full week.

Friday, 26

■ Last day for receiving applications for admission to the LL.B. program.

■ Last day for withdrawing from Second Term courses or for changing from "credit" to "audit" in Second Term courses by students in the Faculty of Law.

Friday, 26 and Saturday, 27

University orientation.

11.9 March, 1982

Monday, 1

■ Last day for withdrawing from Second Term courses, or for changing from "credit" to "audit", in Second Term courses, by students in the following faculties: Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculté Saint-Jean, and Science.

■ Last day for receiving applications for admission for Spring Session 1982.

Monday, 15

Advance registration in the 1982-83 Winter Session begins for continuing students in undergraduate programs.

Wednesday, 17

■ Last day for applications for supplemental examinations to be written in April.

11.10 April, 1982

Thursday, 1

■ Last day for receiving applications for admission to the B.F.A. (Drama) program.

■ Last day for receiving registrations for Spring Session 1982.

■ Last day for receiving applications for Admission for Summer Session 1982.

Wednesday, 7

■ Last day of classes except for students in Dentistry, and Medicine.

■ Last day for payment of Survey School fees for second-year Civil, Mining, and Agricultural Engineering students.

Friday, 9

Good Friday; University buildings closed.

Monday, 12

■ Last day for payment of Spring Camp fees for students registered in FOR 301.

**Tuesday, 13*

Final examinations begin except for students in Dentistry and Medicine.

**Final Examinations (IF ANY) for all on-campus courses offered at 1700 hours or later, are to be held during the last regular class period.*

Tuesday, 13 to Wednesday, 28

Final examinations in Law.

Friday, 23

Last day of classes for students in Dentistry.

Monday, 26

Four week Clinical Session for students in the third year of the B.Sc. in Nursing Basic degree program and one week of field experience in Community Health Nursing in the B.Sc. in Nursing Post-basic program begin.

■ Last day for submission of unbound theses and Notices of Completion of Non-thesis Programs to the Faculty of Graduate Studies and Research to ensure graduation at Spring Convocation.

Monday, 26 to Saturday, May 8

Survey School for second-year Civil, Mining, and Agricultural Engineering Students.

Wednesday, 28

■ Last day of classes in first and second years of the M.D. program.

Thursday, 29

Final examinations begin in Dentistry.

Friday, 30

■ Last day for continuing students in B.A., B.F.A. or B Mus. programs to advance register.

Last day for receiving registrations for Summer Session 1982.

11.11 May, 1982

Monday, 3

■ Last day for receiving applications for admission to B.F.A. (Art and Design) and Rehabilitation Medicine programs.

Third year B.Sc. (M.L.S.) students begin year of practical training.

Hospital practice begins for students in Faculty of Rehabilitation Medicine.

Spring Session First Term and full courses begin. (Classes will be held on Saturday, May 28, in lieu of the May 24, Victoria Day holiday).

Comprehensive examinations begin in first, second and fourth years of M.D. program.

Friday, 7

■ Last day of program in fourth year Medicine.

Sunday, 9

Charter Day.

Tuesday, 11 and Wednesday, 12

Medical Council of Canada examinations.

Wednesday, 12

■ Notice of intention regarding attendance at Spring Convocation must be given by 12 noon.

Monday, 17

■ Last day for applications to B.Sc. in Nursing Basic and Post-Basic degree programs.

Monday, 24

Victoria Day; University buildings closed.

Tuesday, 25

Second Term courses begin for Spring Session 1982.

Monday, 31 to Thursday, June, 3

Convocation (Parts I to IV).

11.12 June, 1982

Tuesday, 1

■ Last day for non-matriculated adults to apply for admission to the First Term in the Faculty of Arts.

■ Last day for receiving applications for admission and applications for re-enrolment for persons wishing to enter the B.Ed. and B.Ed./A.D. programs in the First Term of the 1982-83 Winter Session. Applications received after this date will be considered only if resources permit.

■ Last day for students in the Faculty of Education to advance register for on-campus evening courses. Education students not registered by this date must register at the in-person registration (in accordance with the published schedule).

Friday, 4

■ Last day for advance registration of students in the Faculty of Arts who have transferred to Honors, B.F.A., or B.Mus. programs.

Monday, 14 to Friday, 18

Regular Supplemental examinations for students in the LL.B. program.

Tuesday, 15

■ Last day for students who have been required to withdraw to notify their Dean that they wish to seek re-admission.

■ Last day for submission of all forms and supporting documents for re-admission after an absence, or for transfer, or for admission to the B.Sc. in Engineering program by University of Alberta students and by students who have attended other post-secondary institutions.

Wednesday, 30

■ Last day of classes in third year of M.D. program.

Seventy-fifth University year ends.

12 CLASSIFICATION OF PROGRAMS AND STUDENTS

12.1 Programs of Study

The faculties of the University offer programs leading to a degree, a diploma, or entrance to a further program, as shown below. Years of study are counted from university matriculation unless otherwise noted.

	Years of Study
Faculty of Agriculture and Forestry	
B.Sc. (Agricultural Engineering)	4
B.Sc. (Agriculture)	4
B.Sc. (Food Science) (inter-disciplinary program)	4
B.Sc. (Forestry)	4
Pre-Veterinary Medicine program (leading to entrance to Veterinary Medicine program at The University of Saskatchewan)	2
Faculty of Arts	
B.A. (Honors)	4
B.A. (General)	3
B.A. (Special)	4
B.A. (Special) in East Asian Studies	4
B.F.A.	4
B.Mus.	4
B.A. (Canadian Studies)	4
Faculty of Business Administration and Commerce	
B.Com.	4
Faculty of Dentistry	
D.D.S. (after two pre-professional years)	4
Postgraduate Diploma — See Faculty of Dentistry Calendar	
Dental Hygiene Diploma	2
Faculty of Education	
B.Ed. (Elementary, Industrial Arts, Secondary, Special, or Vocational route)	4
Graduate diploma in Education, or B.Ed. after previous degree — see Faculty of Education Calendar.	
Faculty of Engineering	
B.Sc. (Chemical, Civil, Electrical, Mechanical, Metallurgical, Mineral, Mining, Petroleum	4
Faculty of Home Economics	
B.Sc. (H.Ec.) (Clothing and Textiles, Foods and Nutrition, or Family Studies program)	4
Faculty of Law	
LL.B. (after a University degree or two years of study acceptable to a University in Alberta towards a B.A. degree)	3
LL.B./M.B.A. (combined program)	4
Faculty of Library Science	
M.L.S. (Two post-graduate years. See Faculty of Library Science calendar.)	
Faculty of Medicine	
M.D. (after two pre-professional years)	4
B.Sc. (Medical Laboratory Science)	4
Faculty of Nursing	
B.Sc.N.	4
B.Sc.N. (post-basic program, after hospital graduation and at least one year of experience.)	2
Faculty of Pharmacy and Pharmaceutical Sciences	
B.Sc.	4
Faculty of Physical Education and Recreation	
B.P.E.	4
B.A. (Recreation Administration)	4
Faculty of Rehabilitation Medicine	
B.Sc. (Physical Therapy)	4
B.Sc. (Occupational Therapy) (pre-professional year required)	3
B.Sc. (Speech Pathology and Audiology) (pre-professional year required)	3
Teaching Diploma in Occupational Therapy (after graduation in Occupational Therapy and at least two years of clinical experience)	2
Faculté Saint-Jean	
Faculté Saint-Jean offers B.A. (General), B.A. (Special), B.Sc. (General), and B.Sc. (Specialization) programs, a four year B.Ed. program, and a two year B.Ed. after previous degree program for students wishing to study in a bilingual and bicultural environment.	
Faculty of Science	
B.Sc. (Honors)	4
B.Sc. (Specialized)	4
B.Sc. (General)	3
Faculty of Graduate Studies and Research	
M.A., M.B.A., LL.B./M.B.A. (combined program), M.Ed., M.Eng., M.F.A., M.Pharm., M.H.S.A., M.L.S., M.Mus., M.Nurs., LL.M., M.Sc., M.V.A., Ph.D., Ed.D., D.Mus., M.Ag.— See Graduate Studies and Research Calendar, §§ 201 to 204.	

12.2 Classification of Students

12.2.1 UNDERGRADUATE AND GRADUATE STUDENTS

(1) *Undergraduate students* are those who are registered in a faculty other than the Faculty of Graduate Studies and Research. These students fall into two categories:

(i) Full-time students — those who are enrolled in the equivalent of three or more half courses in a term.

(ii) Part-time students — those who are enrolled in the equivalent of fewer than three half courses in a term.

(2) *Graduate students* are those who have been admitted to the Faculty of Graduate Studies and Research. These students are designated as "Full-time" or "Part-time" by the Faculty of Graduate Studies and Research according to their workload of courses and/or research. A more detailed classification of graduate students will be found in § 202.1 of the Graduate Studies and Research Calendar.

12.2.2 INTRAMURAL AND EXTRAMURAL STUDENTS

(1) *Intramural Students* are those who are attending The University of Alberta at Edmonton or any of its off-campus centres.

(2) *Extramural Students* are those who, although not attending The University of Alberta at Edmonton or any of its off-campus centres, are permitted to take one or more courses by correspondence or directed study. This privilege may be granted by a faculty in special circumstances.

12.2.3 CLASSIFICATION OF UNDERGRADUATE STUDENTS

(1) *Degree, Diploma, or Certificate Program Students* are those who are registered in a program leading to a degree, diploma, or certificate normally granted by The University of Alberta.

(2) *Special Students* are those who have been permitted to register in one or more courses, but not officially for credit towards a degree or diploma at this or any other institution.

(3) *Visiting Students* are bona fide students of other universities or colleges, who have been permitted to take one or more courses for transfer of credit to their own institutions which have agreed in advance to such an arrangement.

(4) *Probationary Students* are students who have been admitted (or permitted to continue) on a probationary basis, because their previous academic record is either deficient in some respect, below the standard ordinarily required, or difficult to assess. Normally, if such students fail to meet the conditions stipulated within the time limit imposed, they will not be allowed to proceed further in their program.

12.2.4 AUDITORS

Auditors are not necessarily admitted students and are not registered for credit, but are attending one or more courses under the following conditions:

*(i) The individual must receive permission from the course instructor, the chairman of the department, and the dean of the faculty in which the course is offered, and the dean of the Faculty in which the auditor is registered.

*(ii) Such permission shall not in itself be a guarantee of admission to the class. The final decision shall weigh class size, impact on credit students, and other factors that the instructor, department or faculty establishes.

*(iii) Courses audited in this manner will not be considered as meeting prerequisite, admission, or course requirements for any University degree program.

(iv) Individuals auditing courses shall limit their participation in the class to that deemed appropriate by the instructor.

*Since final permission to audit a course cannot be given until the number of students registered in the course for credit is known, students and others should not seek authority to register as auditors until the in-person period of registration is completed. The conditions under which a student in one of the other categories listed above may audit courses are given in § 15.1.7.

12.3 Evening Credit Program (Off-Campus), Spring Session and Summer Session

For students living outside the Edmonton area, there are courses offered in the Evening Credit Program on weekday evenings and Saturdays. In 1980-81, centres which provided courses included: Bonnyville; Calgary; Camrose; Drayton Valley; Fort McMurray; Fort Saskatchewan; Grande Centre; Grande Prairie; Lac La Biche; Lloydminster; Red Deer; Regina; Saddle Lake; Slave Lake; Smoky Lake; Spruce Grove; St. Paul; Vegreville; and Viking. A Special Sessions calendar, obtainable from the Office of the Registrar, lists such courses.

In its Spring and Summer Sessions at Edmonton, The University of Alberta offers a considerable selection of courses for the convenience of students who are unable to attend the regular session. Special attention is given to meeting the needs of teachers desirous of improving their professional qualifications. A Special Sessions calendar may be obtained from the Office of the Registrar.

13 ADMISSION

13.1 Matriculation from Alberta: University Requirements

13.1.1 MATRICULATION FROM ALBERTA HIGH SCHOOLS

Every applicant for admission from the high schools of Alberta must normally possess a High School Diploma and an average of at least 60.0% on five appropriate Grade XII subjects and a mark of at least 50% in each. Faculties may require a higher average or exclude specified subjects from the computation of the matriculation average; when either is done, it is indicated in the detailed requirements of the faculty. (See § § 13.3 to 13.19).

Possession of the minimum requirements does not guarantee admission to the university. The University of Alberta may at its discretion refuse admission to any applicant. Admission will normally be refused to an applicant who has had to write what the University considers an inordinate number of examinations in order to attain the nominal entrance requirements of the University.

NOTE A: Biology 32 will be accepted as a matriculation subject if taken before September 1965, and if Biology 30 is not presented in addition.

NOTE B: Language Credits. Applicants wishing to present a language other than one of those presented at the Grade XII level in Alberta should contact the dean of the faculty to which they seek admission.

NOTE C: In some faculties Mathematics 33 may be accepted as a matriculation subject; when it is acceptable this will be indicated in the detailed requirements. In such cases it cannot be presented in addition to Mathematics 30, nor with a subject from Group B (Fine Arts) or with any other subject not listed under Groups A (Humanities) or C (Sciences). Mathematics 33 is not an acceptable prerequisite for university level courses in Mathematics.

13.1.2 LIMITATION ON ENROLMENT IN QUOTA FACULTIES

Enrolment in any faculty will necessarily be limited to the number of students who can be accommodated. When the number of applicants exceeds the number of places available, students are normally accepted in the order of their academic standing from among the whole list of applicants.

Up to 85 per cent of the places in quota faculties are

normally reserved for Alberta residents (as defined below*). For the remaining places, the residence constraints do not apply: our goal is to make at least 5 per cent of the places in quota programs available to foreign students, and at least 10 per cent to non-Alberta Canadians, providing that no non-resident of Alberta is admitted who is less qualified than any Alberta resident who is denied admission.

Prospective students should enquire of the Registrar's Office or individual faculties as to grade point average and other requirements necessary for admission in the previous year, and also as to the number of places available in the desired program.

Limited enrolment is now in force in the following Faculties or Departments: Agriculture and Forestry (B.Sc. in Agricultural Engineering program only), Arts (B.F.A. Drama program only), Business Administration and Commerce, Dental Hygiene, Dentistry, Engineering, Law, Medical Laboratory Science, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, and Rehabilitation Medicine.

Upon notification of acceptance, successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

*A resident of Alberta is defined as a Canadian citizen or Permanent Resident (Landed Immigrant) who has been domiciled in the Province of Alberta or Yukon or Northwest Territories for at least one continuous year immeditately prior to the date of intended registration at the University.

13.2 Admission Requirements

13.2.1 GENERAL INFORMATION

Matriculation requirements at The University of Alberta vary somewhat from one faculty to another. Prospective students should be aware that their choice of matriculation subjects can affect the number of faculties that they will be qualified to enter. If they wish to obtain the maximum freedom of choice among the various faculties, they should take the following six matriculation subjects:

(i) English 30
(ii) Mathematics 30
(iii) Chemistry 30
(iv) a language other than English
(v) an additional subject in Humanities or Fine Arts (as listed in Groups A and B, § 13.2.3 below)
(vi) an additional subject in the Sciences (as listed in Group C, § 13.2.3 below)

13.2.2 PATTERNS OF MATRICULATION REQUIREMENTS

There are four basic patterns of matriculation requirements for admission to The University of Alberta, in each of which some subjects are required while other subjects are optional. Each faculty defines its matriculation requirements in terms of one of these four patterns, usually making some suggestions as to the optional subjects it regards as most appropriate for a prospective student.

The patterns are as follows:

Pattern I
(1) English 30
(2) Mathematics 30
(3) One subject from Group C (Science)
(4) One subject from Group C (Science)
(5) One subject from Groups A, B, or C.

Pattern II
(1) English 30
(2) Chemistry 30
(3) One subject from Group C (Science)
(4) One subject from Group C (Science)
(5) One other subject from Groups A, B, or C

Pattern III
(1) English 30
(2) Language other than English
(3) One subject from Group A or B (Humanities or Fine Arts)
(4) One subject from Group C (Science)
(5) One other subject from Groups A or C

Pattern IV
(1) English 30
(2) One subject from Groups A or C (Humanities or Science)
(3) One subject from Groups A or C (Humanities or Science)
(4) One subject from Groups A or C (Humanities or Science)
(5) Another grade XII subject carrying weight of five credits

13.2.3 CLASSIFICATION OF MATRICULATION SUBJECTS

For the purpose of describing the matriculation pattern above, acceptable Grade XII subjects have been placed in three groups, as follows:

Group A (Humanities)
(1) Social Studies 30
(2) Language (other than English)
(3) Second Language (other than English)
(4) Subject to the conditions noted under the detailed Faculty requirements, *two* of:
Experimental Psychology 30
World Religions 30
Applied Sociology 30
World Geography 30
Philosophies of Man 30
Cultural and Physical Anthropology 30
World History 30
International Politics 30
Microeconomics 30
Macroeconomics 30

Group B (Fine Arts)
(1) Art 30
(2) Art 31
(3) Commercial Art 32
(4) Drama 30
(5) Music 30
(6) Music 31
(7) Performing Arts 32

Group C (Sciences)
(1) Biology 30
(2) Chemistry 30 or 30X
(3) Mathematics 30
(4) Mathematics 31
(5) Physics 30 or 30X

The required subjects for each of the faculties, together with suggested options, are listed below.

13.3 *Faculty of Agriculture and Forestry*

13.3.1 B.SC. PROGRAMS IN AGRICULTURE AND FORESTRY

Matriculation subjects on Pattern I
(1) English 30
(2) Mathematics 30
(3) Subject from Group C (Biology 30 suggested)
(4) Subject from Group C (Chemistry 30 suggested)
(5) Subject from Group A or B or C

Matriculation Subjects from Alberta Agricultural and Vocational Colleges

Alberta Agricultural and Vocational College students applying for admission must present their College Diploma together with three subjects from Group C (Sciences). "C" or higher standing is required in the Group C (Science) subjects. For those subjects taken in 1969 or earlier a "B" or higher standing is required.

13.3.2 INTERDISCIPLINARY B.SC. PROGRAM IN FOOD SCIENCE

A four-year interdisciplinary program in Food Science is offered jointly by the Faculty of Agriculture and Forestry, the Faculty of Home Economics, and the Faculty of Science.

Matriculation Subjects on Pattern II
(1) English 30
(2) Chemistry 30
(3) Subject from Group C (Biology 30 suggested)
(4) Subject from Group C (Mathematics 30 suggested)
(5) Subject from Group A or B or C

Inquiries should be directed to the Dean, Faculty of Agriculture and Forestry.

13.3.3 PRE-VETERINARY MEDICINE PROGRAM

A two-year pre-Veterinary Medicine program at The University of Alberta is designed to qualify students to apply for admission to the Veterinary Medicine program at The University of Saskatchewan.

Matriculation Subjects on Pattern I
(1) English 30
(2) Mathematics 30
(3) Subject from Group C (Biology 30 recommended)
(4) Subject from Group C (Chemistry 30 recommended)
(5) Subject from Group A or B or C

13.3.4 B.SC. IN AGRICULTURAL ENGINEERING

See § 13.8 (B.Sc. in Engineering) for admission requirements.

13.4 *Faculty of Arts*

13.4.1 B.A. PROGRAM

Matriculation Subjects on Pattern III
(1) English 30
(2) Language (other than English)
(3) Subject from Group A or B (Social Studies 30 recommended)
(4) Subject from Group C
(5) Subject from Group A or C (or B, if a Group B subject is not used for (3) above).

NOTE A: *Mathematics 30.* Students proposing to specialize in Economics, Mathematics, Political Science, or Psychology are advised to offer Mathematics 30 as one of their options. At considerably less convenience to themselves, students who lack credit in Mathematics 30 may enrol for Mathematics 100 during their first year at the University, in order to prepare for such specialization.

NOTE B: *Mathematics 31* is required for the B.A. with Honors in Mathematics.

NOTE C: *Equivalents of Music 30 or 31.* In terms of the Western Board of Music, the qualifications equivalent to Music 30 or 31 would be Grade VIII Practical and Grade IV Theory. In terms of the Royal Conservatory of Music of Toronto, the equivalent would be Grade VIII Practical and Grade II Theory and Grade III Harmony. Documents from the Western Board of Music or the Royal Conservatory must be presented to the Alberta Department of Education for evaluation.

NOTE D: Additional subjects listed in Group A (4) will not be accepted in lieu of any of the five subjects required for admission to the Faculty of Arts.

NOTE E: *Matriculation Deficiencies.* Courses (usually numbered 100) at the Grade XII level are offered at the University for students who are beginning their study of a particular subject. A matriculant admissible to any other faculty in the University, but deficient one of the subjects required by the Faculty of Arts may be admitted to make up that deficiency for degree credit. A matriculant with more than one such deficiency is not eligible for admission to the Faculty of Arts.

13.4.2 B.F.A. (ART AND DESIGN) PROGRAM

(1) English 30
(2) to (5) Any four of: Social Studies 30, a language other than English, Biology 30, Chemistry 30, Physics 30, Mathematics 30 or 31, one approved Fine Arts subject.

NOTE A: Because enrolment is necessarily limited and because the studies in this interpretive-creative field involve highly specialized training, candidates will be required to satisfy a selection committee that they have the necessary ability and degree of commitment to undertake the program. The selection committee will base its decision upon the evidence derived from an assessment of any course that may have been taken and work done by the candidate, and the testimony of his or her teachers. Assessment may include a special examination and an interview.

NOTE B: As the submission of a portfolio is necessary, candidates are encouraged to apply as early as January 1. Since the assessment of portfolios takes place in the period May 1 to June 30, portfolios and applications must be received not later than May 1.

NOTE C: Enquiries regarding the professional requirements for admission to this program should be directed in the first instance to: the Department of Art and Design, University of Alberta, Edmonton, Alberta, T6G 2E1; or phone 432-3261.

13.4.3 B.F.A. (DRAMA) PROGRAM

(1) English 30
(2) to (5) Any four of: Social Studies 30, a language other than English, Biology 30, Chemistry 30, Physics 30, Mathematics 30 or 31, one approved Fine Arts subject.

NOTE A: Because enrolment is necessarily limited and because the studies in this interpretive-creative field involve highly specialized training, candidates will be required to satisfy a selection committee that they

have the necessary ability and degree of commitment to undertake the program. The selection committee will base its decision upon the evidence derived from an assessment of any courses in drama that may have been taken by the candidate, the testimony of his or her teachers, experience in dramatic work, and an interview or audition at a centre to be arranged.

NOTE B: As auditions are necessary, candidates are encouraged to apply as early as January 1. Since auditions conducted outside Alberta normally take place in early May, applications should be received not later than April 1.

NOTE C: A non-refundable deposit towards tuition fees, will be required of successful applicants, on official notification of acceptance. (See § 13.1.3)

NOTE D: Enquiries regarding the professional requirements for admission to this program should be directed in the first instance to: the Department of Drama, University of Alberta, Edmonton, Alberta, T6G 2E1; or phone 432-2274.

13.4.4 B.MUS. PROGRAM

(1) English 30
(2) A language other than English
(3) to (5) Any three of: Social Studies 30, a second language other than English, Biology 30, Chemistry 30, Physics 30, Mathematics 30 or 31, one approved Fine Arts subject.

NOTE A: Because enrolment is necessarily limited and because the studies in this interpretive-creative field involve highly specialized training, candidates will be required to satisfy a selection committee that they have the necessary ability and degree of commitment to undertake the program. The selection committee will base its decision upon evidence derived from an assessment of music examinations that may have been taken by the candidate, an interview, and an audition.

NOTE B: Candidates are encouraged to apply as early as January 1, even though applications will be received until July 2. Auditions will be arranged during the period April 1 to August 15.

NOTE C: Enquiries regarding the professional requirements for admission to this program should be directed in the first instance to: the Department of Music, University of Alberta, Edmonton, Alberta, T6G 2E1; or phone 432-3263.

13.5 Faculty of Business Administration and Commerce

13.5.1 B.COM. PROGRAM

(1) English 30
(2) Mathematics 30
(3) Subject from Group A or C (Social Studies 30 suggested)
(4) Subject from Group A or C
(5) Subject from Group A or B or C

NOTE A: The requirements of this Faculty differ from Pattern I in that it will accept three subjects from Group A.

NOTE B: Not more than one combination of two of the subjects listed in Group A (4) will be accepted as a matriculation subject, provided Social Studies 30 is not also accepted.

NOTE C: Prior years' experience under the quota indicates that the Faculty is unlikely to be able to admit applicants having averages of 70% or below.

13.6 Faculty of Dentistry

13.6.1 D.D.S. PROGRAM

Satisfactory completion of at least two full years (i.e. 10 full courses) of university work after senior matriculation, including full courses in inorganic chemistry, organic chemistry, physics, and biology. In general, consideration for admission to the limit of available accommodation will be given to those students who meet the minimum criteria established by the admissions committee at the time of selection. Matriculants are advised to enter the Faculty of Science, the Faculty of Arts or Faculté Saint-Jean to fulfill the requirements. All applicants will be required to take the Canadian Dental Association Aptitude Test. A personal interview is a requirement for admission. For further details see § 67.1 of the Faculty of Dentistry Calendar.

13.6.2 DENTAL HYGIENE DIPLOMA

Matriculation Subjects on Pattern II
(1) English 30
(2) Chemistry 30
(3) Biology 30
(4) Subject from Group A or C
(5) Subject from Group A or C

NOTE A: The requirements of this Program differ from Pattern II in that it will accept two subjects from Group A provided that they are not both languages (other than English). Moreover, the Program will not accept a subject from the Approved Fine Arts group. Mathematics 33 will be accepted as one of the optionl subjects if not presented with Mathematics 30.

NOTE B: *Interview.* A personal interview is a requirement for applicants resident in the Province of Alberta. The interview schedule differes from year to year, therefore, applicants will be advised of the arranged interview date by mail. Out-of-Province applicants are required to write a Statement of Self-Assessment, in lieu of the interview. The Statement of Self-Assessment form will be mailed to the applicant, upon receipt of her/his application to the Dental Hygiene Division at the University of Alberta.

NOTE C: *Aptitude test.* All applicants are now required to write the Dental Hygiene Aptitude Test. Since the test dates are January, February and March, 1981, application by December 1, 1980 is encouraged. Test application forms may be obtained from the Division of Dental Hygiene Room 2032, Dentistry-Pharmacy Center, University of Alberta, Edmonton, Alberta, Telephone 432-4150 or 432-4479.

NOTE D: *Academic Standing.* Enrolment in the Dental Hygiene Diploma Program is limited. Applicants profiles are made up of: Academic Standing, DHAT Score, Interview Score OR Statement of Self Assessment Score. Minimum criteria are established for each of the above factors. An applicant who falls below the minimum in any one of the above factors will not be considered for admission.

NOTE E: *Dental Examination.* All accepted candidates are required to have a dental examination form (available from the Dental Hygiene Division Office) completed by a dentist and returned to the Chairman, Division of Dental Hygiene the week after registration.

NOTE F: Further information is given in § 67.1.3 of the Faculty of Dentistry Calendar.

13.7 Faculty of Education

13.7.1 B.ED. PROGRAM

Matriculation Subjects on Pattern IV
(1) English 30
(2) Subject from Group A or C
(3) Subject from Group A or C
(4) Subject from Group A or C
(5) Another Grade XII subject carrying a minimum weight of five credits

NOTE A: *Choice of Matriculation Subjects.* Matriculants are advised to present those Grade XII subjects basic to the subject area in which they plan to specialize.

NOTE B: *Choice of the Second, Third and Fourth Subjects.* A combination of two of the subjects listed in Group A (4) will be accepted as the second, third or fourth matriculation subject provided Social Studies 30 is not also one of those subjects.

NOTE C: *Choice of the Fifth Subject.* A student may not present for admission as the fifth subject a subject in the same field as one of the other four subjects except where the subject used as one of the first four subjects is a prerequisite or a corequisite for the fifth subject.

NOTE D: *Equivalents of Music 30 and 31.* In terms of the Western Board of Music, the qualifications equivalent to Music 30 or 31 would be Grade VIII practical and Grade IV theory. In terms of the Royal Conservatory of Music of Toronto, the equivalent would be Grade VIII Practical and Grade II Theory and Grade III Harmony. Documents from the Western Board of Music or the Royal Conservatory must be presented to the Alberta Department of Education for evaluation.

NOTE E: *Vocational Education Route.* To gain admission to a B.Ed. program, Vocational Education route, a student must meet special admission requirements. These requirements are outlined in detail in § 73.5.1 of the Faculty of Education Calendar. A student might present the following modified matriculation pattern:
(1) English 30
(2) Subject from Group A or C
(3) Subject from Group A or C
(4) Vocational Education 32 subject
(5) Vocational Education 32 subject
The average on (1), (2), and (3) must be at least 60% with no grade below 50%. The average on (4) and (5) must be at least 65% with no grade below 50%.

NOTE F: *Interview.* Applicants may meet the requirement of the faculty interview by attending a program counselling session set up by the Faculty Admissions Committee. Applicants will be contacted to arrange a suitable time.

NOTE G: *Speech Test.* Since competence in spoken English is a requirement of admission to the Faculty of Education, a speech test is required of all applicants for first admission. This test is over and above the English language proficiency requirement outlined in § 14.3 of the University Regulations and Information for Students Calendar. Students must sign up for the speech test during the first in-Person Registration period. Registration in Education Practicum courses will not be permitted unless speech clearance has been obtained.

NOTE H: *Non-Matriculated Adult Applicants.* Residents of Alberta, who are Canadian citizens or Permanent Residents (Landed Immigrants) and who do not meet the regular matriculation requirements may qualify for admission to the Faculty of Education by meeting the requirements outlined below.

(a) Applicants must be twenty-one years of age by December 31st in the calendar year in which admission is sought.
(b) Applicants must present to the Office of the Registrar a high school transcript indicating credit in English 30 and one of: Biology 30, Chemistry 30, French 30, German 30 Latin 30, Mathematics 30, Mathematics 31, Physics 30, Social Studies 30, or Ukrainian 30. A minimum mark of 50% in any one course and an average of 60% in the two courses presented for admission is required.
(c) Applicants should communicate with Student Counselling Services (telephone 432-5205) for testing and an interview. A positive recommendation is required from Student Counselling Services.

NOTE I: *Further Information.* Information about admission with advanced standing, etc., is given in § 72.1 of the Faculty of Education Calendar.

13.8 Faculty of Engineering

13.8.1 B.SC. PROGRAM IN ENGINEERING

Matriculation Subjects on Pattern I
(1) English 30
(2) Mathematics 30
(3) Chemistry 30 (See NOTE)
(4) Physics 30 (See NOTE)
(5) Subject from Group A or B or C

NOTE: Students lacking either Physics 30 or Chemistry 30 may be considered for admission at the discretion of the Dean. In such cases program adjustments may be necessary.

13.9 Faculty of Home Economics

13.9.1 B.SC. PROGRAM IN HOME ECONOMICS

Matriculation Subjects on Pattern II
(1) English 30
(2) Chemistry 30
(3) Subject from Group C
(4) Subject from Group A or C
(5) Subject from Group A or B or C

NOTE A: The requirements of this Faculty differ from Pattern II in that it will accept two subjects from Group A.

NOTE B: Either Food Science 30 or Clothing and Textiles 30 may be presented in place of one subject from Group B.

NOTE C: A combination of two of the subjects listed in Group A (4) will be accepted as the fourth or fifth matriculation subject, provided Social Studies 30 is not also one of those subjects.

NOTE D: Students wishing to enter the Foods and Nutrition program are strongly recommended to complete Biology 30 and Mathematics 30.

NOTE E: Students wishing to enter the Family Studies program are advised to select Biology 30.

NOTE F: Students wishing to enrol in the Clothing and Textiles program are advised to complete Social Studies 30.

NOTE G: Mathematics 33 may be presented in place of a subject from Group B if Mathematics 30 is not also presented. Students presenting this subject and who wish to enrol in the Foods and Nutrition program would be required to take Mathematics 100 at the university.

13.9.2 INTERDISCIPLINARY B.SC. PROGRAM IN FOOD SCIENCE

See under Faculty of Agriculture and Forestry, § 13.3.2, above.

13.10 Faculty of Law

13.10.1 LL.B. PROGRAM

To be considered for admission to the LL.B. program, a candidate must normally have completed a degree recognized by The University of Alberta. For this purpose, successful completion of three years of a four-year Bachelor of Arts program at a recognized Alberta university is acceptable.

In special circumstances, the Committee will consider applications from Alberta residents, "Mature" applicants, and "Native" applicants without a degree who have completed not less than two years of post-secondary studies that would be accepted for credit towards a Bachelor of Arts degree at a university in Alberta.

All applicants are required to complete the Law School Admissions Test (LSAT) and also submit a resume. Details are included on the Law application form.

For further information regarding admission, consult the Faculty of Law calendar.

For information regarding the combined LL.B./M.B.A. program see the Faculty of Law calendar, § 101.3.4 and the Faculty of Graduate Studies and Research calendar, § 203.1.2.

13.11 Faculty of Library Science

13.11.1 M.L.S. PROGRAM

A Bachelor's degree from a recognized institution of higher learning, with academic standing acceptable to the Faculty of Graduate Studies and Research and the Faculty of Library Science.

A reading knowledge of a modern language other than English is advisable.

Preference is given to applicants who have had library experience under professional supervision before registration.

Applicants are judged not only upon their academic record but also by their professional promise as indicated in three letters of reference. A personal interview, arranged at a time and place convenient to the applicant, may also be required.

For further information consult the calendar of the Faculty of Library Science.

13.12 Faculty of Medicine

13.12.1 M.D. PROGRAM

Satisfactory completion of at least two years of university work approved by the Faculty of Medicine including at least 8½ required courses of a ten-course program of study. The required courses will form the basis upon which the scholastic level for admission to the M.D. program will be assessed. Students intending to fulfill these requirements at The University of Alberta must complete:

Year 1.

Chemistry 200 or 202 or 250
English 210 (or other English course(s) totalling 6 credits)
Physics 212, Physics 205/207 or Physics 205/209 if applicant possesses Physics 30; or Physics 203/207 or Physics 203/209 if applicant does not possess Physics 30
Biology 296
One of Biology 297, 298, or 299
Psychology 260
Mathematics 202 or 203 or equivalent.

Year 2.

Chemistry 302 (if Chemistry 250 was taken in first year) or Chemistry 350 (if Chemistry 200 or 202 was taken in first year),
Genetics 351; or, alternatively, Biology 297 and Genetics 375. (If Biology 297 was included in the first year program, a half-year option in Arts or Science may be taken.)
Zoology 325
Microbiology 315
Psychology 261
Statistics 241
An Arts option which may be a full-year course or two half-year courses.

Matriculants are advised to enter the Faculty of Science or Faculté Saint-Jean to fulfil these requirements. All applicants are required to complete the New Medical College Admissions Test (MCAT) and may be required to present themselves for a personal interview. For further details, see § 122.1 of the Faculty of Medicine Calendar.

13.12.2 B.SC. PROGRAM IN MEDICAL LABORATORY SCIENCE

(1) English 30
(2) Chemistry 30
(3) and (4) Any two of: Biology 30, Physics 30, Mathematics 30
(5) Subject from Group A or C.

Required average

At least 65.0 per cent.

All applicants are required to either have a personal interview or submit acceptable references.

NOTE: Applicants are more likely to be accepted if they possess an average of over 74.0 per cent.

13.13 Faculty of Nursing

13.13.1 B.SC. N. PROGRAM

Matriculation Subjects on Pattern II

(1) English 30
(2) Chemistry 30
(3) Subject from Group C (Biology 30 strongly recommended)
(4) Subject from Group A or C
(5) Subject from Group A or B or C

Required average

At least 65.0 per cent.

NOTE A: The requirements of this Faculty differ from Pattern II in that it will accept two subjects from Group A.

NOTE B: Mathematics 33 may be presented as one of the optional subjects in place of one subject from Group B if Mathematics 30 is not also presented.

NOTE C: A combination of two of the subjects listed in Group A (4) will be accepted as the fourth or fifth matriculation subject, provided Social Studies 30 is not also one of those subjects.

NOTE D: Applications from high school students require the completion of ALL the following items by MAY 15:

(i) The University of Alberta Application for Admission form;
(ii) References (2).

Applications from transfer students from other University of Alberta faculties and other post-secondary institutions require the completion of ALL the following items by May 15:

(i) The Unversity of Alberta Application for Admission or Re-enrolment Form;
(ii) Two references;
(iii) Complete and official transcripts of all secondary and post-secondary education.

Applications from students who have previously been in the program and wish to re-enrol in the faculty require the completion of ALL the following items by MAY 15:

(i) The University of Alberta Application for Re-enrolment Form;
(ii) Personal interview with faculty member in the Faculty of Nursing;
(iii) Two references:
(iv) Satisfactory academic achievement (minimum G.P.A. 5.0).

Applications from non-matriculated adults require completion or proof of the following by May 15:

(i) The University of Alberta application for admission;
(ii) Two references;
(iii) an Alberta High School Diploma (100 credits) or the equivalent;
(iv) English 30 and Chemistry 30 or equivalent with a grade of at least 50% in each course;
(v) the applicant must be 21 years of age by the beginning of the session or term to which application is made;
(vi) satisfactory recommendation from Student Counselling Services;
(vii) residency in Alberta or the Yukon or Northwest Territories as a Canadian citizen or Permanent Resident (formerly Landed Immigrant) for one full year prior to the intended registration.

NOTE E: Please see the Faculty of Nursing calendar for further information.

13.13.2 B.SC.N. PROGRAM FOR REGISTERED NURSES

Matriculation Subjects on Pattern II

(Same as in § 13.13.1 except that the matriculation average required is 60.0%.)

NOTE A: Psychology 260/261 or equivalent is required for admission to the B.Sc.N. Program for Registered Nurses.

NOTE B: Applicants must be Registered Nurses from approved schools of nursing, and must provide evidence of eligibility for registration in the A.A.R.N. and evidence of active registration or licensure in a Canadian nursing association or college.

NOTE C: Since enrolment is limited by quota, preference is given to applicants with at least one year of graduate nursing experience, and who have submitted applications and all required documentation before May 15th.

NOTE D: Please see the Faculty of Nursing calendar for further information.

NOTE E: Please contact the Faculty of Nursing for information regarding admission as a non-matriculated adult.

13.14 Faculty of Pharmacy and Pharmaceutical Sciences

13.14.1 B.SC. PROGRAM IN PHARMACY

Matriculation Subjects on Pattern II

(1) English 30
(2) Chemistry 30
(3) Biology 30
(4) Subject from Group C (Mathematics 30 recommended)
(5) Subject from Group A or B or C (Physics 30 suggested)

NOTE A: If students present another matriculation subject in place of Biology 30 they will be required to obtain credit in Biology 30 or take Biology 130 prior to registration in B.Sc. in Pharmacy program. Students completing this requirement during Summer should contact the Faculty of Pharmacy.

NOTE B: Prospective students must submit Pharmacy College Admission Test scores with their applications for admission or as soon as possible after they apply. PCAT application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building.

NOTE C: Applicants must submit a letter with their application for admission setting forth their reasons for seeking admission to the Faculty of Pharmacy and Pharmaceutical Sciences.

13.15 Faculty of Physical Education and Recreation

13.15.1 B.A. PROGRAM IN RECREATION ADMINISTRATION

Matriculation Subjects on Pattern III (modified)

(1) English 30
(2) Subject from Group A (a language other than English recommended)
(3) Subject from Group A or B
(4) Subject from Group C (Biology 30 recommended)
(5) Subject from Group A or C (Mathematics 30 or 31 recommended).

NOTE A: Only one language other than English from the Group A subjects will be accepted.

NOTE B: Equivalents of Music 30 and 31. In terms of the Western Board of Music, the qualifications equivalent to Music 30 or 31 would be Grade VIII Practical and Grade IV Theory. In terms of the Royal Conservatory of Music of Toronto, the equivalent would be Grade VIII Practical and Grade II Theory and Grade III Harmony. Documents from the Western Board of Music or the Royal Conservatory must be presented to the Alberta Department of Education for evaluation.

NOTE C: All applicants are required to complete a questionnaire and supply two letters of reference.

13.15.2 B.P.E. PROGRAM

Matriculation Subjects on Pattern IV

(1) English 30
(2) Subject from Group A or C
(3) Subject from Group A or C
(4) Subject from Group A or C
(5) Another Grade XII subject carrying a minimum weight of five credits

NOTE A: Only one language other than English from Group A subjects will be accepted. Biology 30, Physics

30, and Chemistry 30 are strongly recommended.

NOTE B: A combination of two of the subjects listed in Group A (4) will be accepted as the second, third, fourth or fifth matriculation subject, provided Social Studies 30 is not also one of those subjects.

NOTE C: All applicants are required to successfully complete the Faculty's Fitness Test, arrange for an interview with a faculty member, complete a questionnaire and present a letter from a medical doctor indicating that they are fit for vigorous physical activity. This requirement does not have to be met before admission; the Faculty of Physical Education and Recreation will advise students of the procedure in completing their test and interview.

13.16 Faculty of Rehabilitation Medicine

13.16.1 B.SC. PROGRAM IN PHYSICAL THERAPY

Matriculation Subjects on Pattern I

(1) English 30
(2) Mathematics 30 or Mathematics 33
(3) Subject from Group C (Biology 30 strongly recommended)
(4) Subject from Group A or C (Chemistry 30 recommended)
(5) Subject from Group A or B or C (Physics 30 recommended)

NOTE A: Physics 30 will be a required subject beginning September 1983.

NOTE B: If Mathematics 33 is presented, the applicant may not present a subject from Group B.

NOTE C: All North American applicants to the Physical Therapy Program will be required to write the "Allied Health Professions Admissions Test". For further information see § 162.1.3 of the Faculty of Rehabilitation Medicine Calendar.

NOTE D: All applicants to the Physical Therapy program will be required to visit a hospital Physical Therapy Department and to fill out a report form provided by the Physical Therapy Department of the University. See § 162.1.3 for further details.

13.16.2 B.SC. PROGRAM IN SPEECH PATHOLOGY AND AUDIOLOGY

All applicants must have satisfactorily completed one year of study (five full courses) at a university or college including the following University of Alberta courses or their equivalents: Speech Pathology and Audiology 280 and 281, and Psychology 260 and 261. At the University of Alberta, this year may normally be taken in the Faculties of Education or Science. Please contact the Department of Speech Pathology and Audiology for further details.

13.16.3 B.SC. PROGRAM IN OCCUPATIONAL THERAPY

All applicants must have satisfactorily completed one year of study (five full courses) at a university or college including the following University of Alberta courses or their equivalents: Occupational Therapy 207 and 208, Psychology 260 and 261, and one full laboratory science course.

An interview is required and the appointment must be made no later than May 1st in order to be considered for the next academic year.

13.16.4 TEACHING DIPLOMA PROGRAM IN OCCUPATIONAL THERAPY

Graduation from a recognized school of Occupational Therapy, followed by a minimum of two years clinical practice, is required for admission.

13.17 Faculté Saint-Jean

Programs offered are:
B.A. (General)
B.A. (Special)
B.Ed. (Elementary and Secondary Routes)
B.Ed. (after previous degree)
B.Sc. (General)
B.Sc. (Specialization)

Matriculation Subjects

B.A. Program
(1) English 30
(2) French 30 or 31, or Langue et Littérature 30
(3) Subject from Group A or B (Social Studies 30 recommended)
(4) Subject from Group C
(5) Subject from Groups A or C

B.Ed. Program
(1) English 30
(2) French 30 or 31, or Langue et Littérature 30
(3) Subject from Groups A or C
(4) Subject from Groups A or C
(5) Another grade XII subject carrying a weight of five credits

B.Sc. Program
(1) English 30
(2) French 30 or 31, or Langue et Littérature 30
(3) Mathematics 30
(4) Subject from Group C
(5) Subject from Group C

NOTE A: An applicant may be admitted with a deficiency in any subject except French 30 or equivalent, but will be required to clear that deficiency during the first year of the program. An applicant with more than one deficiency will not be admissible.

NOTE B: Additional subjects listed in Group A (4) will be accepted for admission if Social Studies 30 is not also presented.

NOTE C: Equivalents of Music 30 or 31: In terms of the Western Board of Music, the qualifications equivalent to Music 30 or 31 would be Grade VIII Practical and Grade IV Theory. In terms of the Royal Conservatory of Music of Toronto, the equivalent would be Grade VIII Practical and Grade II Theory and Grade III Harmony. Documents from the Western Board of Music or the Royal Conservatory must be presented to the Alberta Department of Education for evaluation.

NOTE D: B.Ed. and B.Sc. applicants are advised to present matriculation subjects that are basic to their intended area of specialization.

NOTE E: B.Ed. applicants may not present a fifth subject of matriculation from the same field as any of the first four subjects, except where the subject used as one of the first four subjects is a prerequisite or corequisite for the fifth.

13.18 Faculty of Science

13.18.1 B.SC. PROGRAMS

Matriculation Subjects on Pattern I
(1) English 30

(2) Mathematics 30
(3) Subject from Group C
(4) Subject from Group C
(5) Subject from Group A or B or C

NOTE: Because of the large number of programs offered in the Faculty of Science, recommendations regarding choice of optional subjects will be found in § § 182.1 of Faculty of Science calendar. Students wishing to enter Honors or Specialization programs and those intending to follow one of the pre-professional programs are particularly urged to consult that section.

13.18.2 INTERDISCIPLINARY B.SC. PROGRAM IN FOOD SCIENCE

See under Faculty of Agriculture and Forestry, § 13.3.2, above.

13.18.3 PRE-MEDICAL PROGRAM

See under Faculty of Medicine § 13.12, above.

13.19 Faculty of Graduate Studies and Research

General admission requirements for the Faculty of Graduate Studies and Research will be found in § 202.2 of the Graduate Studies and Research Calendar. Additional requirements, if any, for a particular graduate program will be found in the description of the program in § 204.

13.20 Non-Matriculated Admissions

The University of Alberta is prepared to consider applications for admission to most undergraduate programs that do not require a pre-professional program from adults who do not meet the matriculation requirements of faculties. To receive consideration, an applicant must normally be at least 21 years of age and domiciled in Alberta, or in the Yukon or Northwest Territories. As admission requirements differ for each faculty, the appropriate faculty office or the A.P.E.L. Division, Office of the Registrar, 432-4537 should be contacted.

NOTE: Students are not accepted as non-matriculated adults into Medical Laboratory Science and Rehabilitation Medicine.

13.21 Admission on transfer from Alberta Public Colleges or Provincially Administered Institutions

Subject to the selection requirements established for quota programs and the English language requirement (see § 14.3 below), The University of Alberta will accept as having satisfied the matriculation requirements any applicant for admission who has successfully completed at least the course equivalent of a one-year full-time program at an Alberta Public College or Provincially Administered Institution, and who is recommended in writing by the sending institution as having satisfied the matriculation requirements of the chosen University of Alberta program. Where further selection precedures are involved in the admission to a program each applicant will be considered on the same basis as any other person seeking admission to that program.

13.22 Admission from Other Provinces and Territories of Canada

Students from another province in Canada who have successfully completed work at the standards shown below and would be admissible to a university in their home province will be considered for admission to The University of Alberta subject to the requirements for the first year courses in each program and to the subject requirements of the faculty as given in preceding sections.

British Columbia, Manitoba, New Brunswick, Nova Scotia, Prince Edward Island, Saskatchewan—Grade XII graduation.

Ontario—Grade XIII graduation.

Newfoundland—Successful completion of one year at Memorial University.

Quebec—Successful completion of the first year of the C.E.G.E.P. academic program with satisfactory performance in appropriate subjects.

A student who does not possess these requirements may clear deficiencies by completing Alberta Grade XII subjects.

13.23 Admission from Outside Canada

All international students are invited to contact the International Student Office, 225 Athabasca Hall, for information pertaining to their tenure as a student in Canada.

13.23.1 THE UNITED STATES

Applicants from the United States may be considered for admission if they present a full academic high school program plus scores in College Entrance Examination Board Scholastic Aptitude tests and in Achievement tests specified by the dean of the faculty that they wish to enter. They will be required to present scores that compare favorably with the mean scores achieved by Alberta matriculants.

13.23.2 GREAT BRITAIN, WEST INDIES, EAST AND WEST AFRICA, HONG KONG

General Certificate of Education — Either (i) five passes, of which two should be at the Advanced Level, or (ii) four passes with three at the Advanced Level, are required. The remaining passes must be at the Ordinary Level.

Higher School Certificate — (i) five passes with two at the Principal Standard or (ii) four passes with three at the Principal Standard. The remaining passes must be at the Subsidiary Standard. (Credit Level passes, or higher, in the examination for the School Certificate will be accepted in lieu of Subsidiary Standard passes.)

West African School Certificate — Credit Level passes, or higher in the examinations for the West African School Certificate will be accepted in lieu of Ordinary Level passes. A student must meet the remaining admission requirements as for the General Certificate of Education.

Hong Kong Examinations Authority: Hong Kong Certificate of Education Examinations and Hong Kong Advanced Level Examinations. Either (i) five passes with two at the Advanced level or (ii) four passes with three at the Advanced level are required. Passes at the

Ordinary level standard in the Hong Kong Certificate of Education examinations are required in the remainder of the subjects prescribed for admission.

NOTE A: Chemistry at the Advanced Level or Principal Standard is required for admission to the Faculties of Engineering, Science, Home Economics, Nursing and Pharmacy and Pharmaceutical Sciences; the Diploma program in Dental Hygiene; and the Bachelor of Science degree programs in Food Science and Medical Laboratory Science.

NOTE B: Mathematics at the Advanced Level or Principal Standard is required for admission to the Faculties of Business Administration and Commerce, Engineering, Rehabilitation Medicine, and Science; the Bachelor of Science degree programs in Agriculture and Forestry; and the Pre-Veterinary Medicine program.

NOTE C: Required subjects presented at the Advanced and Ordinary Levels must meet our minimum average of C or the equivalent of 60.0% for most programs. A higher overall academic standard is required for admission to those programs with limited enrollment.

13.23.3 AUSTRALIA AND NEW ZEALAND

Australian and New Zealand Leaving or Matriculation Certificates — In general a student who has matriculated or qualified to matriculate at a university of recognized standing in Australia or New Zealand will be considered for admission to this University on a reciprocal basis, subject to the requirements for the first-year courses in each program.

13.23.4 OTHER COUNTRIES

Applicants educated in other countries will be considered for admission on the merit of their application.

14 APPLICATION PROCEDURE

14.1 Application Deadlines

The following deadlines are effective for submitting applications for admission to the 1981-82 Winter Session, complete with all required supporting documents.

D.D.S. and Dental Hygiene programs—February 2
LL.B. program—February 27
B.F.A. (Drama) program—April 1
B.F.A. (Art & Design) program—May 1
Rehabilitation Medicine—May 1
B.Sc. in Nursing Programs—May 15
B.Ed. and B.Ed./A.D. Programs—June 1
B.Sc. in Engineering applicants who have previously attended post-secondary institutions—June 15
Other Undergraduate Programs—July 2
M.D. program—November 1, 1980 (for admission to the 1981-82 session)

Applications received after these deadlines will not necessarily be accepted; if they are accepted, they will be processed after all applications received prior to the deadline.

14.2 Application Procedure for New Students

Enquiries from prospective undergraduate students should be addressed to the Registrar. An Access Centre has been created in the Office of the Registrar as an advisory office for all categories of new students other than those eligible for direct admission into the Faculty of Graduate Studies and Research. The Access Centre is located on the main floor of the Administration Building (Room 128). Telephone enquiries may be directed to 432-4537. Those who wish to enter the Faculty of Graduate Studies and Research should address enquiries to the Office of the Dean of Graduate Studies and Research. Telephone enquiries may be directed to 432-3499.

A prospective student should obtain an Application for Admission form and, after completing it, should return it to the appropriate office together with the $20.00 application fee.

Applicants should also arrange to have a transcript of their high school and any college or university record sent to the appropriate office: for prospective undergraduate students, the Office of the Registrar; for graduate students, the Faculty of Graduate Studies and Research. Nationals of countries other than Canada and Canadian students who have completed matriculation or some university or college credit courses outside of Canada will have their academic credentials evaluated for admission and placement purposes by the International Student section of the Office of the Registrar, Room 128, Administration Building, telephone no. 432-4537. Applicants currently attending Alberta high schools may obtain transcript request forms from their schools. The completed forms should be mailed to the Alberta Department of Education. Other applicants should order their transcripts from the appropriate Department of Education or other institution maintaining such records.

The $20.00 application fee is required of all students but is to be paid only once. Therefore, a student who applies one year but does not attend and applies in the following year would not be required to pay the fee again.

All applications for admission to the University should be made as soon as possible and in any case by the deadline prescribed in § 14.1.

14.3 English Language Proficiency for Admission to Undergraduate Programs at The University of Alberta

General Requirements

English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status,

applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education;

or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

a. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

b. Applicants presenting a TOEFL score of less than 600 but 550 or greater will usually be considered as having a minor deficiency. Subject to the requirements of the particular Faculties, such an applicant may be granted conditional admission into the University but will be required to successfully complete one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in his or her regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated (as in (a) above).

c. An applicant presenting a TOEFL score of less that 550 will be considered as having a major deficiency in the language of instruction and will not be admitted into the University of Alberta until proficiency can be demonstrated.

Specific Faculty Requirements

Some faculties may require greater strength in English communicative skills than is required in other programs. These additional requirements are detailed in the Faculty regulations section of the Faculty Calendar. In applying to such faculties the applicant must satisfy the additional language requirements as well as meet the general requirements outlined above. Students seeking entry as non-matriculated adults should see the special English proficiency requirements detailed in the Faculty Regulations sections of the Faculty Calendar.

Further information is available from the A.P.E.L. Division, Office of the Registrar, Room 128, Administration Building. TOEFL application forms are available from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building; or by writing direct to Educational Testing Service, Princeton, New Jersey, U.S.A., 08540.

14.4 Advanced Standing, Advanced Placement and Credit by Special Assessment

14.4.1 ADVANCED STANDING

Advanced standing may be granted to applicants for admission who have completed some university work at another recognized university or college. Advanced standing is used to reduce the length of the program the student will take at The University of Alberta. However, a student proceeding towards a first degree will normally attend at least one academic year and take a full year's program and this may limit the standing that can be granted.

The amount of advanced standing is determined by faculty regulations, and shall be subject to the same regulations as for those transferring from one faculty to another within the university.

Some provincial post-secondary institutions in Alberta and British Columbia have approved university transfer programs that provide for advanced standing. For transfer from these institutions The University of Alberta will accept for credit toward an undergraduate degree the first, or the first and second years of university studies, provided the courses being presented are listed in the appropriate university or Provincial transfer Guide and to the extent that the courses fit the degree program to which the student wishes to transfer.

A copy of the annual Alberta Provincial transfer Guide which explains the nature and (insofar as possible) the detail of credit equivalences between various post-secondary institutions in Alberta is available from:

Alberta Council on Admissions and Transfer
#902, 11920 - 100 Avenue
Edmonton, Alberta
T5K 0K5

or

Admissions Policy, Evaluation and Liaison Division,
Office of Registrar,
Room 128 Administration Building,
The University of Alberta
T6G 2M7
Telephone: 432-4537

14.4.2 ADVANCED PLACEMENT

Advanced placement may be granted to applicants who have taken the equivalent of university courses in some other manner. This excuses them from taking the corresponding university courses, but other courses must be taken in their stead.

If applicants feel they may be eligible for either advanced standing or advanced placement, they should ensure that the application is submitted well in advance of the deadlines given in § 14.1. The University reserves the right to require applicants for advanced standing or advanced placement to write examinations at any level including that of matriculation.

14.4.3 CREDIT BY SPECIAL ASSESSMENT

Some faculties have agreed to allow students to seek credit in certain specified courses without actually registering in and taking courses, if they can demonstrate an acceptable level of mastery of the course content. The procedure whereby a student seeks credit in a course by this non-traditional route is known as *Credit by Special Assessment.*

Faculties, in consultation with departments, will determine which, if any, of their course credits may be

earned by special assessment, and the conditions that a student must satisfy in order to have an application approved. Interested students are advised to contact their faculty.

The privilege of seeking credit in a course by special assessment is limited to students admitted to the University.

Students wishing to complete course credit(s) by this means are advised to report to their Faculty Office in order to be apprised of faculty regulations and deadlines for submission of applications.

14.5 Physical Examination

As a general rule, a physical examination of applicants seeking admission to the University is not required. However, students planning on entering any of the following Faculties or Programs: Dentistry, Medicine, Nursing, Physical Education and Recreation, or Dental Hygiene should consult the appropriate faculty calendar for further details.

14.6 Application Procedures for Continuing and Former Students

Students who have previously registered and are continuing in the same program without interruption are not required to re-apply for admission to subsequent years unless they have been advised that they may not continue in the program.

Students who wish to register either in another program within the same faculty or in a program offered by another faculty must complete an Application for Re-enrolment form which may be obtained from the Registrar's Office. The application must be approved by the Dean who is responsible for the program the student seeks to enter. Students are advised to consult the academic schedule and their faculty calendars to ensure that they meet application deadlines which vary for different faculties.

Students who have interrupted their program must also complete an Application for Re-enrolment form which will be handled in the same manner as that outlined in the paragraph above.

If students have interrupted their studies because they were required to withdraw, they should ensure that their intention to seek re-admission is communicated to the appropriate Dean by June 15. This date is set to ensure that adequate counselling may be given. Full details of the regulations concerning re-admission in this situation are given in § 16.4.5.

15 REGISTRATION AND FEES

15.1 Registration

15.1.1 REGISTRATION PROCEDURE

Students should consult the Academic Schedule, § 11 of this Calendar, to determine the date on which they should register. Other necessary details will be supplied prior to registration.

The program in which a student seeks to register is in every case subject to the approval of the faculty concerned. Students should note that they are required to register in courses in which they are deficient before registering in any other courses. The faculty councils reserve the right to adjust courses to meet the needs of timetables of lectures and examinations. Registration in courses which directly conflict on the timetable will only be allowed when the express permission of the faculty council concerned has been secured.

15.1.2 RESPONSIBILITY FOR REGISTRATION

Students are responsible for the completeness and accuracy of their registration. They are also responsible for adjustments in registration made necessary by supplemental examination results. Particular care should be exercised with regard to prerequisite courses.

15.1.3 LATE REGISTRATION

Students are normally required to complete their registration by the date specified in the academic schedule. After the end of the registration period, registration will be permitted only in exceptional circumstances and students may find that the course offerings are limited.

15.1.4 CHANGES IN REGISTRATION

Students may not abandon a course, change from one course to another or change the term of registration in a course without first obtaining permission from their Dean. This permission, in the form of a "Change of Registration" form signed by the Dean, must be presented to the Registrar before the change becomes official. Changes in registration will not normally be approved after the deadline appearing in the Academic Schedule. In some Faculties students will be assigned a failing grade if they abandon a course after dates specified for withdrawal in the Faculty Regulations section of the appropriate Faculty Calendar.

15.1.5 CANCELLATION OF REGISTRATION

Students who wish to withdraw from the University should report at once to Student Counselling Services in order to complete "Notice of Withdrawal" forms which must then be submitted to their dean for approval. For further information see § 15.2.5.

15.1.6 MAY-AUGUST SUMMER PERIOD

Graduate students who are working full-time on their graduate program during part or all of the period from May to September are encouraged to record their presence on campus at their department office. Those holding University awards during this period *must* so record their presence. Full residence credit is given for this period if the student has signed the record. There is no fee. Registration for the Spring Session or Summer

Session is considered separately for residence purposes from the May-September summer period if the student has signed the record.

15.1.7 REGISTRATION TO AUDIT A COURSE

Students who are classified as degree, diploma, or certificate program students in § 12.2.3, or other individuals, may be granted official permission to audit a course on the understanding that participation in the class will be limited to that deemed appropriate by the instructor. An auditor, or a regular student who wishes to audit a course or courses, must present to the Registrar written permission from the instructor in the course, endorsed by the student's dean, to register in the course as an auditor. Auditors who are not also taking other courses for credit must still register.

15.2 Fees

15.2.1 DEFINITION

There are two major classifications of fees, Instruction and General. Instruction fees are set by the Board of Governors, assessed by the Registrar (Graduate Registrar in the case of graduate students) and collected by the Comptroller. General fees are set by student governing bodies as well as the Board of Governors and follow the same assessment and collection procedures as Instruction fees.

Fees other than Instruction and General will be assessed in particular cases as they apply (see § 15.2.12).

Details of fees for other sessions, i.e., Spring Session, Summer Session, and Evening Credit Program are described in the Special Sessions Calendar.

15.2.2 ASSESSMENT

For the purpose of assessing fees, and fee refunds, the winter session is divided into two equal terms. The First Term runs from September through December and the Second Term runs from January through April.

Students are classified as either graduate (those registered in the Faculty of Graduate Studies and Research) or undergraduate (those registered in other faculties) and sub-classified in each term as either full-time or part-time. Full-time undergraduate students are those who are enrolled in the equivalent of three or more half-courses in a term. Part-time undergraduate students are those who are enrolled in the equivalent of fewer than three half-courses in a term. Graduate students are designated as "Full-time" or "Part-time" by the Faculty of Graduate Studies and Research according to their workload of courses and/or research. A more detailed classification of graduate students will be found in § 202.1 of the Graduate Studies and Research Calendar.

For fee purposes a full course will be treated as two half courses, with one half course applying to each term.

The assessment of Instruction and General fees for both terms will be done at the time of registration. Instruction fees are assesses on a per course basis up to a certain maximum. Schedules of these fees for each program are provided in § 15.2.7 to § 15.2.12.

15.2.3 PAYMENT

Registration is regarded as incomplete until fees have been paid in accordance with the regulations detailed below (see particularly § § 15.2.4 and 15.2.5).

(1) The following regulations regarding payment of fees apply to undergraduate students (refer to § 15.2.4 for details on late payment penalties):

WHERE: In the Ice Arena.

WHEN: Full fees as detailed on your fee assessment form are due and payable by cash or cheque during Registration Week — Tuesday, September 1st to Saturday, September 5th, as scheduled in your Advance or In-Person Registration Procedures Booklet.

Students who have paid a $50.00 quota deposit as a requirement for admission to their faculty should deduct this amount from their tuition fees assessment total when paying their fees.

Students who register for the full session may elect to pay fees in two instalments. The first instalment will be the first term assessment. The second instalment will consist of the second term assessment plus an instalment charge of $5.00.

NOTE: Students who do not make payment in accordance with the foregoing should report with fee assessment form to the Comptroller's Office, third floor of the Administration Building. Payment may then be made to the Cashier between the hours of 9:00 a.m. and 4.00 p.m. Monday through Friday.

Students making payments by cheque may follow the above procedure. However, where practical, students are encouraged to place cheques in a special deposit box provided in the main floor rotunda of the Administration Building up to September 30. Cheques may also be mailed to the Comptroller but note that the University cannot accept responsibility for the actions of the post office in cases of payments received by the University after the deadline date. All cheques should be made payable to *The University of Alberta*. Also, the fee assessment form should be enclosed with the cheque in the special fees remittance envelope which is provided.

The last date for payment of fees without penalty for full session students and First Term only students is September 30.

The last date for payment of fees without penalty for Second Term only students and for the second instalment by full session students is January 15. Payment is to be made as detailed in NOTE above.

Receipts for the payment of fees received by mail will not be issued unless requested later. Your cancelled cheque is your receipt. Students whose fees are paid in full will receive official receipts for income tax purposes before February 28, 1982.

(i) *Students whose fees are to be paid from assistance through The Students Finance Board of The Province of Alberta*

Upon receipt of the Certificate of Eligibility from the Board, each student should submit all copies to the Fees wicket, where the Confirmation of Enrolment section will be completed, including the amount of fees to be remitted by the bank to the University. The Students Finance Board requires that full Instruction and General fees due to an educational institution are the first charge against any financial assistance awarded. Further, the Board makes provision for full allowance for fees in its first disbursement. In cases where the assistance awarded is less than full fees, the balance of fees payable will be subject to normal fee payment regulations.

Students processing certificates after the September 30 deadline for payment of fees will not be assessed a late payment penalty if:

— the student had appropriately completed the "Financial Assistance Expected" section of the registration form or otherwise had informed the

Comptroller's Office not later than mid-September that financial assistance was expected.

— the application for assistance was made to the Board not later than mid-September. Note that it is advantageous to students to submit applications as early as possible, namely from about mid-July onwards.

— the assistance awarded is at least sufficient to pay the first instalment of fees or if not sufficient to pay the first instalment, the deficiency is paid at the date of submission of the Certificate.

(ii) *Students whose fees are to be paid by scholarships, bursaries or other assistance, either directly to or by The University of Alberta.*

If the award is sufficient to pay at least First Term fees, the "Financial Assistance Expected" section of the student's registration form should have been completed, giving the amount of the assistance and the source of the award. If this was not done, the student should submit the information to the Comptroller's Office not later than mid-September.

(iii) *Students who receive assistance directly.*

Students who receive assistance directly, i.e., not through the University, are subject to normal fee payment regulations and they are required to follow the payment procedure detailed in (i) above, even though the University may be required to provide confirmation of registration.

(iv) *Students age 65 and over who are eligible for remission of fees.*

Students eligible for remission of fees shall:

— be age 65 or more at commencement of the Session,

— submit proof of age,

— be a resident of the Province of Alberta.

The remission of fees (including auditing fees) shall apply to undergraduate credit courses only. The Application for Remission form is available at the Fees wicket, third floor of the Administration Building, and should be completed prior to September 30 (January 15 in the case of Second Term only registrants).

(2) Similar regulations to those detailed in (1) above apply to graduate students, with the following changes (refer to § 15.2.4 for details on late payment penalties):

(i) During registration a fee information sheet will be given to each graduate student who will then calculate the amount of his/her fee assessment and pay same in accordance with (1) above. Subsequently, a fee assessment form will be mailed to each student showing the amount of his/her fees. In the event that this amount is greater than that calculated by the student, the difference is due and payable immediately on receipt of the mailed assessment form.

(ii) Graduate students who elect to pay fees in instalments may do so as follows:

First instalment — First Term fees as calculated by student (see (i) above) due not later than September 30.

Second instalment — Second Term fees plus a $5.00 instalment charge, due on or before January 15.

15.2.4 LATE PAYMENT PENALTIES

(1) *Undergraduate students*

(i) The last day for payment of fees is September 30. If the student is paying in two instalments, the last day for payment of the first instalment is September 30; and of the second instalment, January 15. A penalty of $15.00 will be charged when the payment is received by the University after these dates. Students are reminded that the University cannot accept responsibility for the actions of the post office if payments are not received by a deadline date. In addition, if payment has not been made by October 15 for First Term fees and February 1 for Second Term fees, registration will be subject to cancellation and the student to exclusion from classes.

(ii) When registration is cancelled, a reassessment of fees will be made to the date of cancellation and the amount unpaid entered on the student's record. Future registrations will not be accepted and all certification of academic records will be withheld until the account has been settled.

(iii) When a student has been permitted to register late, the last date for payment of fees will be fifteen days after the date of assessment. A penalty of $15.00 will be charged when the payment is received after this date. If payment is in instalments, the last date for payment of the second instalment is January 15 and the above penalty provision applies.

(iv) The last day for payment of fees for those students who are registered in Second Term course(s) only is January 15. A penalty of $15.00 will be charged when the payment is received after this date. In addition, if payment has not been made by February 1, registration will be subject to cancellation and the student to exclusion from classes together with action by the Registrar detailed in (ii) above.

(2) *Graduate students.*

A penalty of $15.00 may be charged when payment of First Term fees is received after September 30, and, when paying by instalments, payment of Second Term fees is received after January 15. In addition, if any fees remain unpaid by February 1, registration will be subject to cancellation and the student to exclusion from classes. Refer to (1)(ii) above for resulting action by the Registrar. The same conditions as stated above for payment of Second Term fees apply to students assessed fees for the Second Term only.

15.2.5 WITHDRAWALS AND REFUNDS

Students who wish to withdraw from the University should report at once to Student Counselling Services in order to complete "Notice of Withdrawal" forms which must then be submitted to the Dean for approval. Students who withdraw without completing such forms will not be eligible for any refund of fees nor for exemption from fees in the event that they have not been paid.

When a student withdraws from one or more courses, his/her fees will be reassessed on a per course basis with the fee for each dropped course prorated in accordance with the table below. If the total reassessment for a term exceeds the maximum listed for the particular program or faculty, it will be reduced to that maximum.

Students who change courses from credit to audit will be assessed the table percentage at credit rate and the balance of 100%, if any, at audit rate.

Assessment per Term
Percentage of

Date of Withdrawal	Per Course and General Fees
First Term	
Prior to Sept. 18*	0%
Sept. 18 to 30	20%
Oct. 1 to 15	40%
Oct. 16 to 31	60%
After Oct. 31	100%
Second Term	
Prior to Jan. 12*	0%
Jan. 12 to 31	20%
Feb. 1 to 15	40%
Feb. 16 to 28	60%
After Feb. 28	100%

**First day after deadline for registration and changes in registration.* Corresponding dates for Graduate students are October 1 and February 1.

Undergraduate students will be assessed a $10.00 administration charge on withdrawal from the University and the $15.00 registration fee assessed all graduate students will be retained in the event that a graduate student withdraws from the University.

Graduate students whose fees are assessed on a program basis rather than on a per course basis will, for the purpose of fee assessment on withdrawal, be assessed a maximum of one-half of full Winter Session fees for each of the two terms.

Refunds will be authorized when the previously paid fee assessment exceeds the assessment to date of withdrawal. The effective date of withdrawal is that on which the Dean signs the required forms. In the event that a revised assessment following withdrawal results in unpaid fees, students will be held responsible for payment in full of the difference.

15.2.6 CHANGES IN FEES AND FEE PAYMENT PROCEDURES

The University reserves the right to change its fees from year to year without notice. Students who have not completed their program when a change is made will pay at the new rate for the balance of their program.

15.2.7 UNDERGRADUATE FEES

(1) *Instruction fees* are charged for each term of the Winter Session as follows:

For fee purposes a full course is treated as two half-courses, with one half-course applying to each term.

All faculties (except as below)	
Per half-course	$ 93.00
More than 3 half-courses, maximum	303.00
Engineering	
Per half-course	115.00
More than 3 half-courses, maximum	380.00
Dentistry and Medicine (M.D. program only)	
Per half-course	138.00
More than 3 half-courses, maximum	454.00
Medical Laboratory Science (third year only)	151.00
Visa students (add differential fee to Instruction fee above)	
Per half-course	55.00
More than 3 half-courses, maximum	182.00

In no case will the differential fees charged a Student Visitor (Visa Student) in the six-month period July 1 to December 31, or January 1 to June 30, exceed the single term maximum differential fee of $182.00. If change of status to Permanent Resident (Landed Immigrant) occurs during a Session, there may be a corresponding change to the differential fee charged.

(2) *General Fees* are charged for each term of the Winter Session as follows:

Students' Union (except as below)	
Taking one or two half-courses	5.00
Taking three or more half-courses	18.50
Students' Union (students in Dentistry, Education (B.Ed. / A.D. and Diploma programs), Law, Medicine first & second years) taking three or more half-courses	14.50
Students' Union (students in Medicine third & fourth years)	3.00
University Athletic Board (Due to high demand, facilities are not always available). Optional at registration if taking one or two half-courses	13.00
University Athletic Board Taking three or more half-courses	13.00
University Health Service (See § 18.2.2) Optional at registration if taking one or two half-courses. Mandatory if taking three of more half-courses	6.00

The fee for a full course is double that of a half-course. This applies as well to the differential fee assessed Student Visitors (Visa Students).

NOTE: Spring and Summer Sessions and Evening Credit Program (Off-Campus) Instruction fees are the same as above; General fees are less. Full details are described in the Special Sessions Calendar.

15.2.8 UNDERGRADUATE PROGRAM FEES

The following fees are charged by program for students registered in the Faculty of Nursing in the Advanced Practical Obstetrics and Nurse Practitioner Certificate courses:

(1) Instruction fee	$224.00
(2) General Fees	
Registration (Advanced Practical Obstetrics only)	12.00
Registration (Nurse Practitioner only)	6.00
Students' Union (Associate Membership)	5.00
University Athletic Board (Optional at registration)	13.00
University Health Service (Optional at registration)	5.50

15.2.9 UNIVERSITY OF ALBERTA HOSPITAL SCHOOL OF NURSING

The following fees are charged for each term for students registered in the diploma course in nursing at the University of Alberta Hospital School of Nursing:

Students' Union privileges	10.25
University Athletic Board (Optional at registration)	13.00

Note: These students are entitled to Unversity of Alberta Library privileges.

15.2.10 FULL-TIME GRADUATE PROGRAM FEES

Students who commenced their program prior to the current Winter Session will be charged at the rates shown below only for that portion of the program fee applicable to their registration in the current Winter Session and subsequent sessions.

(1) *Instruction fees.* Except where otherwise noted, the following fees are the current total amounts for the minimum period within which it is possible for a student to complete the degree program:

Qualifying year for holders of any bachelor's degree from a three-year undergraduate program (The University of Alberta or equivalent)	$759.00
Master's degree, for holders of a bachelor's degree from a four-year program continuing in the same field (equivalent of University of Alberta honors degree)-Category A	759.00
Master's degree, for holders of a bachelor's degree from a four-year program (beyond senior matriculation), changing field or specializing for the first time—Category B	1,139.00

Doctor of Philosophy or Doctor of Education degree for holders of a master's degree continuing in the same field, $759.00 a year for two years 1,518.00

Doctor of Philosophy or Doctor of Education degree for holders of a bachelor's degree with honors, $759.00 a year for three years 2,277.00

To maintain continuous registration when not otherwise registered in course(s), and for all doctoral and master's candidates, and qualifying graduate students per year of registration after total instruction fee has been paid 60.00

Student Visitors (Visa Students) are assessed a differential fee which is to be added to the Instruction fee above in accordance with the following regulations.

(a) For full-time graduate students the differential fee will be $182.00 for each of the first and second terms up to the maxima noted below.

(b) For part-time graduate students the differential fee will be $55 per half-course and $110 per full course subject to the maxima noted below.

(c) In no case will the differential fees charged a Student Visitor (Visa Student) in the six-month period July 1 to December 31, or January 1 to June 30, exceed the single-term full-time differential fee of $182.00.

(d) If differential fees continue at the same rate, the following limits will apply to the total differential fees charged to a graduate student while registered in a particular category or program:

Qualifying year(s)	*no limit*
Master's degree, category A	$364.00
Master's degree, category B	546.00
Ph.D. or Ed.D. for holders of Master's degree continuing in the same field	728.00
Ph.D. or Ed.D. for holders of Bachelor's degree with honors	1,092.00

If change of status to Permanent Resident (Landed Immigrant) occurs during a Session there may be a corresponding change to the differential fee charged.

(2) *General fees* are charged per session as follows:

Registration	$15.00
Graduate Students' Association	34.00
Students' Union privileges (optional at registration)	29.00
University Athletic Board	26.00
University Health Service (See § 18.2.2)	12.00
Re-admission (charged to students permitted to resume an interrupted program)	70.00

In the qualifying year, a normal program is four or five full session courses (or the equivalent).

Programs for candidates for the master's degree classified in Category "A" will normally not exceed five full session courses (or the equivalent). Those classified in Category "B" will normally not exceed seven full session courses (or the equivalent).

Courses shown on the Program Form of the student as "extra" to the degree program, or to clear deficiencies, will be charged for at the rate per course for the faculty offering the course — see § 15.2.7 (1) — in addition to the regular fee for the degree program. This applies to Probationary Graduate Students as well as to candidates for degrees.

Special Graduate Students and Exchange Graduate Students will be charged $230.00 per full session course and $115.00 per half course to a maximum of the fee for a full year's program.

Students who attend Summer Session and/or Spring Session will be assessed fees for these sessions in addition to any assessment for Winter Session since they are separate from the Winter Session. However, all tuition fees paid for courses on programs in Spring and/or Summer Session will be credited toward the total program fee for the student. Any outstanding balance will be assessed in the student's final session.

15.2.11 PART-TIME GRADUATE PROGRAM FEES

Students who commenced their program prior to the current Winter Session will be charged at the rates shown below only for that portion of the program fee applicable to their registration in the current Winter Session and subsequent sessions.

(1) *Instruction fees.* Part-time graduate students will be charged $230.00 for each full course and $115.00 for each half course they take, up to the amount of the total Instruction fee for the full program. Any outstanding balance will be assessed in the students' final session. Student Visitors (Visa Students) are referred to § 15.2.10 (1) for regulations governing assessment of the Instruction differential fee pertaining to part-time graduate students.

(2) *General fees* are charged per session as follows:

Registration	$15.00
Graduate Students' Association Intra-mural students only)	23.00
University Athletic Board (Due to high demand, facilities are not always available) (optional at registration)	26.00
University Health Service (See § 18.2.2). (Optional at time of registration)	12.00
Re-admission (charged to students permitted to resume an interrupted program)	70.00

(3) *May-August Period (Intersession).* University Health Service for students registered in courses in the May-August period.

Spring Session	3.00
Summer Session	3.00

University Health Service for students not registered in courses in the May-August period.

(Optional at time of registration)	6.00

15.2.12 OTHER FEES

(1) *Auditing fees.* The fees for the privilege of auditing a course are:

Full course	$72.00
Half course	36.00

The differential fee for Student Visitors (Visa Students) does not apply to courses taken for audit.

(2) *Examination fees.* No fee is levied for *final examinations* written during regular examination periods.

A fee of $15.00 is charged for each *supplemental examination* written during a regular supplemental examination period.

For a *special supplemental examination* a fee of $60.00 is charged for each paper. Where the student has been prevented by illness or other extreme circumstance from writing at the regular supplemental examination time, a portion of the fee may be waived.

A fee of $6.00 is charged for each *deferred final examination* written during a regular supplemental examination period. The fee for a special deferred final examination is $60.00 per paper. Where the student has been prevented by illness or other extreme circumstance from writing at the regular deferred examination time, however, a portion of the fee may be waived.

An additional fee of $20.00 per paper is charged for conducting a supplemental or deferred final examination at an established centre other than Edmonton.

(3) *Special fees.* The following special fees will be assessed in particular cases as they apply:

Transcript fee: the first 10 copies are supplied free of charge; thereafter, the fee is $5.00 for the first copy plus 50c for each additional copy ordered at the same time.

Application for Admission fee	$20.00
Vise fee for the evaluation of documents of persons not seeking admission to the university	25.00
For indexing and microfilming of doctoral thesis by the National Library of Canada	15.00
Course credit by special assessment	75.00
Final examination re-appraisal	20.00

16 ACADEMIC REGULATIONS

16.1 Residence Requirements

Regulations governing residence requirements vary considerably, and the calendars of individual Faculties should be consulted for details. A student proceeding towards a first (bachelor's) degree will normally complete a minimum of one full year's program of studies at The University of Alberta. Normally these studies will constitute the final year of the program.

16.2 Evaluation Procedures and Grading System

At the beginning of the Session each instructor will announce the distribution of weight between term work and final examinations in each course, and the policy with respect to supplemental examinations. In addition he or she will outline the evaluation procedures to be used and explain the grading system.

In each course in which a final examination is held, a weight of not less than 30% and not more than 70% will be assigned to the final examination, except where a departure from this arrangement has been authorized by the faculty council governing the department offering the course. The remaining weight for the course will be assigned to term work. In sections of a multi-sectioned course the distribution of weight will be such that there will be a uniform policy determined by the department with regard to the granting of supplemental examinations. (See § 16.3.4 (1)).

Details regarding the grading system are provided in every student's Course Registration Procedures booklet.

The grading system at The University of Alberta uses the following nine grades:

9	
8	Excellent
7	
6	Good
5	
4	Pass
3	(see Note)
2	Fail
1	

NOTE: A grade of 3 in an individual course will be accepted by a faculty only if warranted by a student's over-all academic record.

In courses taken towards an undergraduate degree or for those used as a prerequisite to another course, the minimum passing grade is 4 unless otherwise specified; in courses taken towards a graduate degree the minimum passing grade is 6. Under the percentage system previously in use, the minimum passing grade in courses taken towards an undergraduate degree was 50 per cent; in courses taken towards a graduate degree, 65 per cent.

Some courses may be offered on a "Pass"/"Fail" basis. Conditions under which students may take such a course are specified by their faculty council.

16.2.1 AEGROTAT STANDING

Aegrotat standing may be granted, in special circumstances, on the ground of illness to a deserving student who has completed at least one year at The University of Alberta in the faculty in which he or she is currently registered. Any student wishing to take advantage of this privilege should apply without delay to the dean of the faculty concerned. Any other student absent from a final examination because of illness may apply for permission to write the regular deferred examination. (See § 16.3.5.)

16.3 Examinations

16.3.1 TERM EXAMINATIONS

(1) *Term examinations optional.* The holding of term examinations is optional with each department.

(2) *Test Week.* Although instructors may give tests during any regular lecture or laboratory period at their discretion, one week in the middle of each of the First Term and the Second Term has been set aside as test week. During these weeks, off-campus extra-curricular activities will not normally be organized by the University.

(3) *Absence from term examination or test.* If a student has an unexcused absence from a term examination or test, the raw score assigned will be zero. However, in case of illness or other extreme circumstance the student may be excused from writing the examination or test. In applying for exemption, students must present to their instructor an absence slip signed by University Health Service where the cause is illness, or by the Registrar where the cause is other than illness. When exemption is granted the percentage weight allotted to the examination or test missed is added to the percentage weight allotted to the final examination.

16.3.2 FINAL EXAMINATIONS

(1) *Final examinations.* A final examination is held in each course except where departure from this arrangement has been authorized by the faculty council governing the department offering the course. In courses completed in the First Term, final examinations are normally held during test week in December. Final examinations for Second Term and Full Session courses are held at the end of the session.

Examinations for Evening Credit Program and Late Afternoon and Evening Courses are to be held during the last regular class period.

(2) *Absence from final examinations.* Any student who is ill or suffering from severe domestic affliction is advised not to sit for a final examination. Instead, he or she should advise the Registrar, within forty-eight hours following the examination, of the circumstances and should apply for a deferred final examination. (See § 16.3.5). Similar action should be taken by any student, who, because of religious convictions or for other cogent reasons, is unable to write a final examination at the scheduled time. Such application will be referred to the student's Dean for a final decision.

When a student is absent from a final examination without acceptable excuse, a final grade may be computed using a raw score of zero for the final examination. In other cases the final grade will be shown as "Absent." The policy with respect to which method of reporting the final grade is used is determined by the faculty of the department offering the course. For the purpose of evaluating the student's overall performance, the interpretation of the grade assigned is the responsibility of the faculty in which the student is registered and it may determine what action will be taken.

(3) *Cancellation of paper during examination.* If a student becomes ill or receives word of domestic affliction during the course of an examination, he or she should report at once to the Supervisor, hand in his or her unfinished paper, and request that it be cancelled. Thereafter, if illness is the cause, he or she must go directly to University Health Service so that any subsequent application for a deferred examination may be supported by a medical certificate. The Registrar should be notified in writing of the circumstances within forty-eight hours of the examination. In certain cases, the decision may be to grant a deferred final examination, which will carry with it no supplemental privilege in case of failure.

(4) *No subsequent cancellation of papers.* Should a student write an examination, hand in his or her paper for marking, and later report extenuating circumstances to support a request for cancellation of his or her paper and for another examination, such request will not be entertained.

(5) *Debarment from final examination.* A student may be refused permission to write the final examination in a course on the recommendation of the department concerned and with the concurrence of the Dean of his or her faculty, in the following circumstances:

(i) The student has neglected to do a substantial portion of his or her written assignments in a course of which these are an essential feature, or has attended insufficiently in a course in which class participation is a necessity.

(ii) The student has neglected to do a sufficient amount of the practical or laboratory work in a course in which these are considered a basic requirement.

(6) *Failure in First Term Course.* A student who has failed the first single term course in a two single term course sequence may proceed to the second single term course unless his or her faculty has ruled otherwise.

(7) *Release of Final Examination Papers.* Departments subscribing to the belief that there is educational value in permitting students to see their final examination papers after they have been marked, may arrange for this to be done. However, papers should not actually be released to students until the deadline for application for reappraisal has passed, as an appeal cannot be entertained after the custody of the paper has been relinquished to the student.

16.3.3 NOTIFICATION OF RESULTS

(1) *Release of Grades.* Only the Registrar's Office is empowered to issue official statements of results or transcripts of records. However, Department Chairmen, or their delegates, are authorized and instructed to release final grades in First Term courses by January 10, and in Second Term or Full-Session courses by May 15, in any manner that will protect the confidentiality of individual student grades. After the end of each university session, statements of record are mailed to each student at the home address specified on their registration. This should not be expected before June 1 at the earliest for the preceding Winter Session.

(2) *Reappraisals.* Since great care is taken in marking final examination papers, a student should apply for reappraisal of a paper only if he or she has good reason to believe that a mistake has been made. Reappraisals are dealt with by the Chairman of the department in consultation with members of the staff. A request for reappraisal must be made by letter to the Registrar (or by completion of an application form in the Examinations and Timetabling Division, Registrar's Office, Rm. 123, Administration Bldg.) by February 1 in the case of First Term courses, by June 25 for other Winter Session courses, and within thirty days of the publication of results for courses offered in the Spring and Summer Sessions. The request must include a statement of whether the intent of the appeal is to raise or lower the grade. If a student fails to include such a statement it will be assumed that the intent is to have the grade raised. The request must be accompanied by a fee of $20.00 for each paper; the fee will be refunded if the appeal is successful.

The privilege of having papers reappraised applies only to final examinations. A student may apply for reappraisal of no more than two papers in each term of the Winter Session. A student in the Spring or Summer Session will be limited to two reappraisals. Normally there is no such privilege for supplementary examinations. Students who have been granted the supplemental privilege and who are awaiting the outcome of a reappraisal should make application for supplemental examinations by the prescribed deadline.

It should be understood that if the grade is changed, the new grade, whether higher or lower than the original, replaces it as the student's official grade in the course.

16.3.4 SUPPLEMENTAL EXAMINATIONS

NOTE: No Supplemental examinations are granted to students registered in Spring and Summer Sessions.

(1) *Granting of supplementals.* Supplemental examinations may be granted by a faculty council in cases where the weight assigned to the final is 40% or higher. However, in any faculty where a student must complete an entire year's work satisfactorily before proceeding to the next, supplemental examinations may also be granted in a course taken exclusively by students of the faculty in question, even where the weight of the final examination is less than 40%. In this instance the weight assigned to the supplemental should not be less than 60%.

(2) *Number of supplementals.* The number of supplemental examinations permitted a student is determined by his or her faculty council. The privilege of writing supplemental examinations may be withheld by the faculty council if the student's grade in the course is very low, or if his or her grade-point average, including the course or courses failed, is below that required

for promotion. Notification of permission to write one or more supplemental examinations is included in the statement of results sent to each student.

(3) *Weighting of supplementals.* The percentage allotted to the supplemental examination shall not be less than the weight that was allotted to the final examination.

(4) *Application.* A student who has been granted the privilege of a supplemental examination must apply to the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building not later than the deadline shown in the Academic Schedule (see § 11), remitting the prescribed fee (see § 15.2.12). No late applications will be accepted.

(5) *Supplemental examination schedule.* A student must write his or her supplemental examinations at the time of the next regular supplemental examinations unless he or she has been granted an extension by his or her Dean. Extension of a supplemental privilege beyond one year of the time that the final examination was written will not be granted.

Supplemental examinations for students in faculties other than Law will be held in early August. Law students will write supplemental examinations in the period commencing the third week of June. However, a student in his or her graduating year who has an excused absence form, or who fails in a First Term final examination in December may, by permission of his or her Dean, be allowed a supplemental examination during the Second Term Reading Week or at the end of the session. Application for such examination must be made at least three weeks before the commencement of the examinations. (See the Academic Schedule, § 11 above.)

(6) *Failure in supplemental examination.* A student who returns to the University having failed a supplemental examination, or having neglected to write it, will be required to repeat the course. In certain cases an equivalent course may be prescribed instead of the failed course.

(7) *Failure in graduating year.* A member of the graduating class who, having exhausted all the regular supplemental examination privileges, still has a failure in one course only, may, with the permission of the faculty council concerned, register in and repeat that course extramurally, unless, in the opinion of the department concerned, it is necessary for him or her to attend classes in the course a second time.

16.3.5 DEFERRED FINAL EXAMINATIONS

(1) *Deferred final examinations.* A student who has missed a final examination because of illness or domestic affliction or who is obliged to be absent from an examination for some other compelling reason (including religious convictions) may apply for a deferred final examination. Application for such an examination must be made to the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building must be supported by a satisfactory medical certificate in the case of illness or other documentation substantiating an absence, and must be accompanied by the prescribed fee (above, § 15.2.12).

(2) *Deferred First Term final examinations.* The time and place of a First Term deferred final examination may be set by mutual agreement among those students who have missed the final examination for good cause and the instructor. If it is not possible to reach mutual agreement, then the examination, for students in faculties other than Law, should be held by Reading Week; Law students will write the examination in February.

(3) *Deferred Second Term and full session final examinations.* Any student who is granted a deferred final examination in a second term or full session course by his or her dean, may write that examination as soon as possible after the end of the second term at a time and place mutually agreeable to the student and the instructor and any other students in the course who are requesting the same privilege. If agreement is not possible, the examination will be scheduled during the regular supplemental and deferred examination period which is in August for students in faculties other than Law and in the third week of June for Law students. Applications to write in August must be submitted by the date specified in the Academic Schedule (§ 11).

16.3.6 SPECIAL EXAMINATIONS

A special supplemental or a special deferred final examination may be granted to a student who is prevented by illness (supported by a medical certificate), domestic affliction, or other extreme circumstance from writing a supplemental examination or a deferred final examination at the regular time. Application must be made to the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building a full month before the special examination is to be written, and must be accompanied by the prescribed fee (see § 15.2.12). Special examinations are normally written on the Saturday before classes begin in September. In certain approved cases they may be written during the regular examination periods in April, May, August, or September.

16.4 Academic Standing

16.4.1 FIRST-CLASS STANDING

First-class standing in a given year shall be awarded to any student who obtains a grade-point average of not less than 7.5 while enrolled in a full normal academic course load in that year: the definition of a full normal academic course load shall be left to the faculty concerned.

16.4.2 DEGREES WITH HONORS

A student in the Faculty of Arts or Science with approved qualifications may proceed to the degree of Bachelor of Arts or Bachelor of Science with Honors by following a more concentrated course of study in a special field under the supervision of one of the departments. The time required for an honors degree is four years from senior matriculation.

Degrees with Honors are awarded in two classes: First Class Honors, and Honors, in accordance with the requirements of the faculty and department concerned.

16.4.3 DEGREES WITH DISTINCTION

At the discretion of the faculty concerned the notation "With Distinction" is inscribed on the permanent record and graduation parchment of a candidate for any degree, except an honors or graduate degree, if the candidate has obtained a grade-point average of 7.5 or higher over the last two years of the program. In the B.F.A. and B.Mus. programs, the candidate is required to carry a full course load in each of the last two years. Students who have taken part of their work at another university may be granted a degree "With Distinction" at the discretion of the faculty concerned.

16.4.4 PROMOTION

Subject to the control of General Faculties Council, promotion regulations are set by the faculties of the University. Details will be found in the Faculty Regulations section of the appropriate Faculty Calendar.

16.4.5 UNSATISFACTORY STANDING

(1) Students who have been admitted to the University with a weak matriculation record may be warned of the fact at the beginning of their first session.

(2) The records of all students are reviewed at the end of each session. Students whose records are found to be unsatisfactory will be notified by their dean and may be referred to Student Counselling Services for re-counselling. They may be denied the privilege of writing supplemental examinations and required to repeat their year. Students whose records are extremely unsatisfactory may be required to withdraw from the University, and normally at least a year must elapse before re-admission will be granted.

(3) Students who have been required to withdraw will not be permitted to re-enter without applying to the dean of the faculty in which they propose to register. The dean may require a student to undergo counselling as a part of the process for obtaining re-admission. Students seeking re-admission must report their intention by letter to the dean not later than mid-June of the year in which re-admission is sought. The letter should include an explanation of their previous difficulties and indicate why the applicants believe that they may now be successful.

(4) Students with an extremely unsatisfactory record at another university will not be considered for admission to The University of Alberta until at least a year has elapsed from the date of their leaving their former university. Thereafter, the procedure outlined in (3) will apply.

(5) Subject to the control of the General Faculties Council, a faculty council may refuse permission to a student or prospective student to enter any year of a program if, in the opinion of the council, the student shows a lack of general educational attainment. Moreover, a student whose record in the classroom, in tests, or in final examinations is unsatisfactory may be required to withdraw from the faculty at any time.

16.4.6 SCHOLASTIC STANDING AND EXTRACURRICULAR ACTIVITIES

Every student, prior to accepting nomination for any position on the Executive Committee of the Students' Union or as the Board of Governors representative, shall be required to obtain a statement of academic eligibility from the Dean of his/her faculty. This statement shall be filed with his/her nomination papers.

To be eligible (1) to represent the University in any competition with outside organizations, (2) to participate in non-competitive University activities which are open to the general public, or (3) to be eligible to hold office in a recognized student organization, a student must be a registered student taking at least one course for credit during each term and must meet the requirements of satisfactory scholastic standing as defined by the Faculty.

16.5 Attendance

Since presence at lectures, participation in classroom discussions and projects, and the completion of assignments are important components of most courses, students will serve their interests best by regular attendance. Those who choose not to attend must assume whatever risks are involved. In this connection the attention of students is directed to § § 16.3.1(3), and 16.3.2(5) of this Calendar.

NOTE: § 16.6—Reserved.

16.7 Appeals and Grievances

General Faculties Council has instructed each faculty to publish in its Calendar not only its academic regulations, but also the procedures whereby decisions affecting the academic standing of a student may be reviewed or appealed.

In addition, General Faculties Council has established an Academic Appeals Committee and has delegated to it authority to hear appeals from students against faculty decisions which affect their academic standing. An appeal may be made only on the basis that there has been a miscarriage of justice.

Students must exhaust the provisions for appeal within their own faculty before taking an appeal to the G.F.C. Academic Appeals Committee.

The G.F.C. Academic Appeals Committee is not authorized to hear an appeal from a decision respecting a mark in an individual course, from an examination decision made in the Faculty of Graduate Studies and Research, from a decision to refuse admission to a quota faculty, or a decision relating to credit for courses taken outside the University of Alberta.

For further information regarding appeal procedures at the faculty level students should seek the advice of their Dean. Students who have been unsuccessful in appealing at the faculty level and who wish to appeal to the G.F.C. Academic Appeals Committee should consult the Executive Assistant to the President in order to learn the procedures to be followed.

If students are unsure of the validity of their grievance or procedures of appeal they should contact the Student Adviser in the Office of Student Affairs.

16.8 Student Records

16.8.1 CONTENTS OF FILES

(1) Only letters and documents pertinent to a student's admission and academic record may be kept in the official files of the Registrar, the Deans, and the Department Chairmen.

(2) Application for Admission forms of any Faculty requiring letters of reference must contain a statement to the effect that the Faculty reserves the right to solicit information from persons other than those named by the applicant as referees provided the student is advised of the names or the offices consulted as additional referees.

16.8.2 STUDENT RECORDS

(1) Official transcripts are issued only upon the request of the student. They are issued to the student personally or to whomever the student designates. An official transcript bears the original signature of a member of the Registrar's staff who has been given authority to sign transcripts, and the official seal of the University is imprinted over the signature.

(2) Unofficial copies of the student's academic record are issued to the student in the form of a year-end Statement of Results; to the student's Dean, and to the Chairman of the Department or designee, in the case of a student registered in a specialized, honors or graduate program. An unofficial transcript or copy of the student's academic record bears neither an original signature nor the University seal.

(3) Unofficial copies of the student's academic record may be issued to the following at their request: Student Counselling Services, when a student has

been referred for counselling by an authorized officer of the University; and the Student Awards Office, where an award made through a University scholarship committee is involved, on the understanding that information regarding the student's academic record will not be furnished to the scholarship donor without the student's consent.

(4) Unofficial copies may be issued at the student's request to other offices or individuals in the University.

(5) Public information regarding students, such as dates of attendance, place and date of birth, city and home address, verification of degree or degrees may be issued at the discretion of the authorized officer of the University to educational institutions, appropriate government agencies, prospective employers, and scholarship donors.

(6) Academic and disciplinary records are separate. The only disciplinary action that will be documented on a student's academic record is one involving the student's suspension or expulsion from the University. There is to be only one official disciplinary record. Prior to January, 1974 disciplinary records were kept by the Dean's Council. Since that date they have been kept in the custody of the Secretary to the General Faculties Council, the Officer responsible for implementing University disciplinary procedures. The only persons having access to such records will be those directly concerned with the action.

(7) Where access to academic records is sought for the purpose of research, such access may be granted by the Executive Committee of General Faculties Council on such terms as may be necessary to ensure the confidentiality of individual student records. Research on student data will be defined as not being within the normal administrative operation of the University. In case of doubt as to what may fall within "the normal administrative operation of the University", the G.F.C. Executive Committee will decide.

16.8.3 LETTERS OF REFERENCE AND RECORDS

(1) The contents of letters of reference regarding a student will not be revealed to the student without the permission of the referee. Letters of reference will be used only for the express purpose for which they have been supplied unless the permission of the referees and the student concerned has been given for other purposes.

(2) Where students have gone on their own initiative as a patient to University Health Service, or as a client to Student Counselling Services, the contents of their files are private, in accordance with professional ethics or codes of behavior.

(3) Where a student has been referred by an authorized officer of the University to the University Health Service or to the Student Counselling Services, the consultant's opinion will be reported to the authorized officer if the student gives written permission to do so. Such written permission shall be granted when the student signs a release form, the nature of which will be determined by the Service in question. The nature and content of any report provided by the consultant will be determined by the ethics and codes of behavior of the consultant's profession. If the student authorizes the consultant to release a report, the consultant may, at his or her discretion, discuss the contents of the report with the student.

(4) Confidential information regarding a student's record may be divulged by a faculty member to institutions, agencies or prospective employers only with the student's knowledge and consent. A faculty member, when called upon to do so, may use discretion in expressing an opinion to such institutions, agencies or prospective employers concerning a student's academic ability, character and personality. However, a record of the opinion so expressed will not become part of the student's file.

16.8.4 EXCEPTIONS TO STATED POLICY

Students who object to the release of information regarding their academic record, in accordance with the policy stated above, should notify the Registrar in writing, giving their specific objections. Appropriate action will be taken by the Registrar, who will so advise the student.

16.9 Graduation

On the recommendations of the faculty councils, degrees are conferred by the Chancellor of the University at a Convocation of the faculty, alumni, graduands, and their guests. Convocations for the conferring of degrees are normally held in the spring and fall of each year.

17 GENERAL REGULATIONS AND INFORMATION

17.1 Withholding of University Documents

In any case where a student has neglected or refused to pay amounts owed to the University, the Registrar has been empowered and directed by the Board of Governors to withhold all forms of certification of the student's marks or of other indicia of academic attainment, such as graduation diplomas, until the student has settled the account with the University. For example, certification with respect to the student's academic attainment may be withheld if the student owes the University for library penalties or fines; for purchases at the University Bookstore; for parking or traffic violations; for breakage or damage to laboratory facilities or supplies; for student fees and University of Alberta Emergency Student Loans; for room and board fees; for fees for supplemental or deferred final examinations; and, for fines imposed by the Discipline, Interpretation, Enforcement Board of the Students' Union, and University Disciplinary Panels and Boards.

18 STUDENT AFFAIRS AND STUDENT SERVICES

18.1 Office of Student Services

18.1.1 DEAN OF STUDENTS

The Dean of Students, 234 Athabasca Hall, is the Senior Administrator in charge of Native Affairs, Student Counselling, Student Awards and Student Affairs. The Dean chairs the Council on Student Services which is comprised of representatives from all the services on campus concerned with the welfare of the student body.

18.1.2 STUDENT AFFAIRS

The Office of Student Affairs, 225 Athabasca Hall, is concerned with the general welfare of students, both as individuals and organizations. The Offices of the Director of Student Affairs, the International Student Adviser, the Student Adviser, CIDA Co-ordinator, and Study and Travel Abroad Reference Room (S.T.A.R.R.) are located here. The CUSO Co-ordinator is located at 239 Athabasca Hall. The Student Affairs Office deals with the academic grievances of students and advises them on appeal procedures when appropriate. International, mature and physically disabled students are advised to contact the Office for a wide variety of necessary information and services. Mature student and international student orientations are annual programs of Student Affairs. Authorization for Special Liquor Permits for social functions held on or off campus by student groups and departments are obtained here. It is, also, the contact point for Continuing University Education (C.U.E.) and Single Parents on Campus (S.P.O.C.).

18.1.3 STUDENT AWARDS OFFICE

The Awards Office administers University Awards at the matriculation, undergraduate and graduate level. Information and application forms for government loan assistance may also be obtained from this office which is located in Room 252, Athabasca Hall.

18.1.4 STUDENT COUNSELLING SERVICES

Counselling is offered on a confidential basis to students and to prospective students throughout the year, there is no charge for the services of the centre.

Counselling with respect to vocational and program choice is available to *prospective students* during their Grade XII year or afterwards. However, concerns regarding the selection of individual courses or options should be directed to the Dean of the Faculty in which one is intending to register.

Students wishing to see a counsellor are advised to arrange an appointment in advance.

University students may use the services for any of the purposes indicated hereunder. Vocational testing is available and other testing is also available at the discretion of a counsellor.

(1) *Study skills.* Individual or group counselling with respect to study methods is available.

(2) *Vocational planning.* A counsellor may be consulted about future plans, including future professional training.

(3) *Personal problems.* Sometimes a student's performance suffers because of worry, restlessness, inability to concentrate, or preoccupation with personal problems. In such circumstances counselling should be sought.

(4) *Change of faculty.* Students contemplating a change of faculty may consult a counsellor. Preferably, this action should take place as early as possible before the beginning of the next University session.

(5) *Withdrawal from university.* Students making a total withdrawal from the University must submit a "Notice of Withdrawal from the University" form to the Office of the Registrar. This form must first be presented at Student Counselling Services for signature. Individuals having any concerns regarding their decision to withdraw or questions relating to re-enrollment or future vocational plans are invited to see a counsellor when submitting their Withdrawal Form for signature. Withdrawing students can *normally* see a counsellor without an appointment.

(6) *Unsatisfactory standing.* Students whose academic standing is unsatisfactory are advised to seek counselling, and, in cases of extremely unsatisfactory standing, may be required to do so by their faculty.

For further information or to arrange an appointment telephone 432-5205 between 8:30 a.m. and 4:30 p.m. weekdays or write the Director, Student Counselling Services, Athabasca Hall, University of Alberta, Edmonton, Alberta T6G 2E8.

18.1.5 ASSISTANTS TO THE DEAN IN RESIDENCE

The Assistants to the Dean in residence represent the University administration in the conduct of student affairs in the residences.

18.1.6 OFFICE OF THE ADVISER ON NATIVE AFFAIRS

This office has been established to assist in communications between the University and native communities. Assistance and advice is available for students or prospective students from native communities, for individuals or groups in the university who wish to work in or with native communities or organizations, and for native groups or individuals who may wish to gain access to the services and resources of the university. In this regard contact is maintained with the native communities and with Student Counselling, Student Health, Student Awards, organizers of special programs, as well as the student services of individual faculties, and the high school liaison division of the Registrar's Office.

Enquiries may be addressed to: Office of the Advisor on Native Affairs, 124 Athabasca Hall, The University of Alberta, Edmonton, T6G 2G5 (Telephone 432-5677).

18.1.7 PHYSICALLY DISABLED STUDENTS

Physically disabled students attending the U. of A. are invited to contact the Office of Student Affairs, Room 225, Athabasca Hall (432-4145), which provides a point of coordination for both students on campus and prospective students. This office provides a special Handbook for Physically Disabled Students and is involved in orientation programs designed to meet their special needs. Students are advised to contact the Office of Student Affairs prior to registration where assistance will be available with program planning, campus mobility, and volunter assistants.

There are certain buildings, notably Tory, which may not be accessible during regular building hours to disabled students. Keys for the purpose of entering such buildings during regular hours can be obtained from the Office of Student Affairs. Special arrangements for writing of examinations can be made through this office.

18.2.1 LIBRARY SERVICES

The libraries of The University of Alberta contain over 2,000,000 volumes and the main collection is housed in the Cameron and Rutherford Libraries. Full information about the University libraries is contained in § 243 of this calendar.

If the desired books are unavailable at the University libraries, students are welcome to make use of the Edmonton Public Library. Students whose permanent residence is outside Edmonton must pay a $30 fee, which entitles them to library privileges for one year.

18.2.2 UNIVERSITY HEALTH SERVICE

Comprehensive medical care is provided throughout the year by the University Health Service. A fee is assessed (See § § 15.2.7 to 15.2.11) to cover pharmaceutical and other ancillary services not paid for by the Alberta Health Care Insurance Commission.

Fully qualified medical and nursing personnel staff the Health Service which is located on the corner of 111 St. & 88 Ave., immediately south of the Law Centre.

Details of the range of services provided may be obtained by contacting the Nursing Supervisor at 432-2612.

18.2.3 HOUSING AND FOOD SERVICES

LISTER HALL

The rates quoted are those charged for the 1980-81 Winter Session. The results of the Student Housing Study may result in structural changes in Lister Hall Residences which in turn may have an effect on rates. Residents must be enrolled as full-time students.

Lister Hall contracts for residence are for the eight month, four month and one month periods and the residence fee covers the period as stipulated in the Residence Application and Contract. Occupancy before or after the contract period will be charged on a per diem basis. Meals for those students who check into residence prior to the contract period will be served on a cash a-la-carte basis.

Meals — Personal Meal Program. The resident will be issued Scrip in the amount shown on board fees as stipulated in the contract period selected which may be used to purchase food at any of the Housing and Food Service outlets or Campus (Lister Hall, S.U.B., C.A.B. Cafeterias and 14 Lunchrooms) subject to the hours of operation posted at each facility.

Students wishing to check into residence prior to or check out after the contract period are requested to advise the Housing Office, in writing, well in advance.

If a room is required outside the contract period it may be necessary to accommodate the student in a room or area other than the one permanently assigned during the normal session.

Charges for room and board are made at the following rates:

CONTRACT RATES (1980-81):

	Single	Double
1. Eight Month Contract		
Room	$1,190.00	$790.00
Board	1,100.00	1,100.00
Total Amount Payable (including $50.00 damage deposit and L.H.S.A. fee)	$2,365.00	$1,965.00
2. Four Month Contract		
Room	625.00	420.00
Board	550.00	550.00
Total Amount Payable (including $50.00 damage deposit and L.H.S.A. fee)	$1,238.00	$1,033.00
3. One Month Contract		
Room	170.00	115.00
Board	150.00	150.00
Total Amount Payable (including $50.00 damage deposit and L.H.S.A. fee)	$374.00	$319.00

PAYMENTS AND DEPOSITS:

1. Eight Month Contract	
Double Occupancy:	
Deposit	$325.00
Payment (to be received by Sept. 14/79)	$820.00
Payment (to be received by Jan. 14/80)	$820.00
Single Occupancy:	
Deposit	$325.00
Payment (to be received by Sept. 14/79)	$1,020.00
Payment (to be received by Jan. 14/80)	$1,020.00
2. Four Month Contract	
Double Occupancy:	
Deposit	$313.00
Payment (to be received by Sept. 14/79 or Jan. 14/80)	$720.00
Single Occupancy:	
Deposit	$313.00
Payment (to be received by Sept. 14/79 or Jan. 14/80)	$925.00
3. One Month Contract	
Double Occupancy: total cost/deposit	$319.00
Single Occupancy: total cost/deposit	$374.00

Applications will not be processed unless accompanied by the required deposit and a recent photograph. An administration fee of $5.00 will be levied on arrears of fees three days after the balance due date.

A student who plans to remain on full room and board during the Christmas vacation should notify the Housing and Food Services office of his or her intention.

PEMBINA HALL

Pembina Hall, a centrally located historic residence, is offered to full-time mature students (21 years of age and over). This 136 room co-educational residence offers an eight months contract only, which includes both room and board, using the same Personal Meal Program noted above.

1980-81 Rates:

Standard Room	$1,140.00	Board	$950.00
Large Room	$1,390.00	Board	$950.00

FACULTÉ SAINT.-JEAN

Faculté Saint-Jean is a co-educational residence housing approximately sixty students in single and double rooms. Faculté Saint-Jean retains a totally French environment in both its residences and classrooms. The buildings are located within two miles of the main University of Alberta campus. A shuttle bus operates hourly connecting Faculté Saint-Jean and the main campus. The 1980-81 Winter Session fee of $1,975.00 single and $1,720.00 double included both room and board. For application or further information contact the Dean's office. Faculté Saint-Jean, 8406-91 Street, Edmonton, Alberta, T6C 3M9.

MICHENER PARK FAMILY
STUDENT HOUSING

The 548 unit complex consists of two high-rise apartment buildings, row houses and maisonettes. Located in Michener Park, three miles south of the University, the housing units are for full-time, family students. The rental charge includes all utilities except the telephone. The units are not furnished but are provided with drapes, stoves and refrigerators; washing and drying machines are available for use by residents. Applications should be submitted as soon as possible, as there is a waiting list.

1980-81 Rates:

Maisonette (gr. flr.)	$210.00
Maisonette (2 & 3 flr.)	240.00
Row House (2 Bed Room)	245.00
Row House (3 Bed Room)	260.00
Galbraith House	235.00
Vanier House	245.50

NORTH GARNEAU HOUSING
COMMUNITY

This 106 unit housing facility offers a co-operative lifestyle and is comprised of houses, duplexes and apartments located on the east Campus. Rents are calculated on a square footage basis and range from approximately $195.00/month for a one bedroom suite to $510.00/month for larger houses. All units are rented on a month to month basis and are unfurnished except for a refrigerator and stove. This area is presently under review for new student housing with construction proposed to commence by the Summer of 1981. This is expected to temporarily reduce the number of units available. Please direct all enquiries to our Administration Office at 44 Lister Hall.

H.U.B.

The University of Alberta Housing and Shopping Complex houses approximately 900 students in 426 apartments on campus. The building, conveniently located at 89th Avenue and 112 Street, is physically linked to the Rutherford Library and the Humanities Centre. One person, two person, and four person apartments provide varying degrees of privacy at a cost in accordance with the amenities. Both furnished and unfurnished units are available. The apartments are rented on a month to month tenancy basis. Rents include all utilities except telephone.

PRESENT RENTAL SCHEDULE (September 1, 1980 — subject to change):

	RENT
One person (unfurnished)	$180.00
One person (furnished)	$208.00
Two person (unfurnished)	$260.00
Two person (furnished)	$290.00
Four person (unfurnished)	$400.00
Four person (furnished)	$465.00
Special End Unit (unfurnished only)	$280.00

A shopping mall is located on the main level of the building. Services include laundry, grocery, drug store, and travel facilities, and a variety of shops, restaurants, and recreational areas are available for students' needs.

HUB is usually fully rented with a waiting list. Interested students should apply early to the HUB Office at 8909-112 Street, Edmonton, Alberta, 26G 2C5 for applications and further information.

Further information and application forms for Pembina Hall, Lister Hall, North Garneau and Michener Park should be addressed to the Director of Housing and Food Services, 44 Lister Hall, 116th Street & 87th Avenue, University of Alberta, Edmonton, Alberta, T6G 2H6. For further information on other University Residences mentioned please write to the address given in conjunction with the residence.

THE UNIVERSITY RESERVES THE RIGHT TO CHANGE THE ABOVE REGULATIONS, RATES, AND SCHEDULES OF PAYMENT WITHOUT NOTICE.

The Student Off-Campus Housing Service. The Student Housing Service, operated by the Student's Union prepares lists of rooms available to students prior to both the Winter and Summer Sessions. The office is located on the second floor of the Student Union Building. As the lists change daily, no attempt is made to send them out by mail. If you require further information please telephone (403)432-4212.

18.2.4 STUDENT EMPLOYMENT

The Canada Employment and Immigration Commission in co-operation with the University maintains a full-time employment service on the campus on a year-round basis. Students at all levels of their studies are invited to use the facilities of this office whether seeking part-time, summer or permanent employment.

Local employers as well as employers from across Canada use the services of the Canada Employment Centre on Campus to interview prospective employees from The University of Alberta. Employment interviews usually commence during the last week of October and continue throughout the academic year. Opportunities are available to school boards who wish to interview on campus.

In order to take advantage of services offered, all students seeking any type of employment are urged to contact the office early in the school term. Employers are encouraged to arrange their on-campus interviewing dates before mid-July. Information concerning companies may be obtained and appointments with company representatives arranged. Employment counselling is conducted by Canada Employment Counsellors and students are urged to seek this assistance. Instruction in Campus Job Search Technique is also available to interested groups.

The Canada Employment Centre on Campus is located on the Fourth Floor of the Students' Union Building. Telephone 432-4291.

18.2.5 BOOKSTORE

The University maintains a large and modern Bookstore in the Students' Union Building, where prescribed textbooks and supplies of all kinds may be purchased. The Bookstore also stocks a wide range of books and other items of special interest to students and faculty.

(1) The returns policy for the Bookstore is seven days from the date of purchase and returned items must be accompanied by a sales receipt.

(2) At the beginning of each session the returns policy is extended and books may be returned as late as the week following the closing date for course changes, provided that they are unmarked and are accompanied by the sales receipt.

(3) Following this date, exchanges and refunds must be made within seven days of purchase and must be accompanied by a sales receipt.

(4) Further returns of books resulting from withdrawal or transfer may be made providing that the books are in an unmarked condition and the student requesting the refund has retained the sales slip and in addition has obtained a copy of the Withdrawal or Change of Registration form from the Office of the Registrar. This request for return must be made within seven days of the withdrawal or transfer.

The Bookstore also buys back certain textbooks in the spring for resale in the fall, provided that they are in good condition.

18.2.6 COMPUTING SERVICES

The Department of Computing Services, located in the General Services Building, is maintained by The University of Alberta as a service facility for the faculty, research staff and students at the University. It provides and operates a computing system to meet the needs of education and research groups at the University and in the community. Users of Computing Services are required to adhere to the "Conditions of Use" policy. Administrative data processing for the University is done by the Office of Administrative Systems (OAS).

Computing Services operates an Amdahl 470V/7 computer with 8 million bytes of memory, under the Michigan Terminal System (more commonly known as MTS). Over 600 computer terminals located in departments across campus provide remote access.

At the central location there are also card readers for batch input, printers (including a Braille printing facility), drums, tape drives, disk drives and a comprehensive telecommunications sub-system. Other facilities include a digitizer, an optical mark scorer, an incremental plotter, an interactive graphics display, an electrostatic printer/plotter, a paper tape reader/punch, and numerous keypunches and terminals for the use of staff and students.

The Department also provides services such as keypunching, text and data entry, contract programming, debugging and consulting, remote terminal maintenance and support, systems development and maintenance, an applications program library, and tape storage. Non-credit courses and seminars are offered and user documentation (including the fortnightly, Bulletin) is provided. In 1980 the University acquired a PLATO system for computer-based education.

18.2.7 DAY CARE CENTRES

The Students' Union and Community Day Care Centre is located in HUB (8917 - 112 St.). The Centre operates from 7:30 a.m. to 5:30 p.m. Monday to Friday with mid-day meals provided. The staff are fully qualified to work with young children. Because the centre is government sponsored, fees are based on family income. Interested students should contact the Day Care Centre at 432-2245.

A second Day Care facility, the Unversity and Community Day Care Centre, is located in Windsor Park School, 8720-118 Street. Although priority for admission is to university staff, limited positions may be available for children of students. Further information may be obtained by contacting the Centre at 433-0070.

18.3 Alumni Association

The Alumni Association dates from 1915 and counts among its members hundreds of graduates in all parts of the world and in all walks of life. Every student automatically becomes a member upon graduation, without fee.

The objectives of the Association are:

(1) Encouragement and support of the development of the University by (a) representation on governing bodies, and (b) interpretation of issues to members and the community at large.

(2) Dissemination to alumni of up-to-date knowledge of the University and its future plans as a basis for (a) the taking of positions on aspects of the operation and development of the University, and (b) intelligent and responsive representation on governing bodies.

(3) Involvement of the largest possible number of alumni in order that allegiance to the University ideal may be fostered.

The Alumni are represented on the Board of Governors and the Senate.

The office of the Alumni Association is located on the fourth floor of Athabasca Hall.

18.4 Athletics

18.4.1 INTRAMURAL ACTIVITIES PROGRAM

The Intramural Program is an organized voluntary program of sports and recreational activities within the University, for both men and women.

All full-time students are eligible to participate as well as part-time students who opt to pay the U.A.B service fee and those faculty members who purchase a privilege card in the West Wing of the Physical Education and Recreation Centre.

The main purpose of the program is to give all students the opportunity to take part in a wide variety of organized activities. Intramurals provide a welcome recreational break from the rigors of academic study, and promote physical fitness and a concern for physical fitness among the participants. Close friendships often result from participation in intramural activities. The students taking part may learn new activities or re-acquaint themselves with old favorites — whatever the case, these activities usually continue to be enjoyed well beyond the University years. As with all recreational activities, intramurals promote a spirit of cooperation and fair play among the participants, and in the case of the student managers and directors of the program, provide valuable experience in administration and leadership. Indeed, intramurals are as worthwhile as they are fun.

18.4.2 INTERCOLLEGIATE ATHLETIC PROGRAM

The intercollegiate program at The University of Alberta is designed to provide diversified competitive opportunities, skilled and qualified coaching and outstanding facilities for students with superior athletic talents. It is designed to further develop and utilize these talents fully in high calibre organized competition with students of similar ability across Canada. The University of Alberta is a charter member of the Canada West University Athletic Association. The *Golden Bears* and *Pandas* compete in the C.W.U.A.A. with men's and women's teams from the Universities of British Columbia, Victoria, Calgary, Lethbridge and Saskatchewan. Conference champions advance to compete in national and international competitions organized by the Canadian Interuniversity Athletic Union. In the past year national championships were held in football, volleyball, basketball, hockey, swimming, cross-country running, soccer, wrestling and gymnastics, for the men and volleyball, swimming, gymnastics,

cross-country running, field hockey and basketball for the women. Thus the opportunity to travel and meet athletes from across Canada and around the world is made available to Golden Bear and Panda participants. Last year a much respected Alberta vitality was generated by 450 athletes, coaches, and managers on 19 men's and women's teams. Team members wore the traditional green and gold colors with pride and enthusiasm.

Spectator participation has proven to be a vital part of the Alberta campus scene as 150,000 students, staff and alumni attended Golden Bear and Panda games during the past session. These activities served as a common rallying point and a diversion from day to day academic endeavors. All full-time students, and those part-time students who pay the Athletic Fee are entitled to free admission to all regularly scheduled events.

Student athletes receive individual recognition for their achievements at the yearly athletic awards night. This is the culminating highlight of the athletic year at the U of A and includes awards for the hardworking managers and student trainers of all the teams. The most highly prized trophies awarded are the Bakewell and Wilson trophies, presented to the top female and male athletes at the University. Award recipients are chosen by a committee made up of faculty representatives and members of the University Athletic Board.

18.5 Transportation and Parking

Traffic and Parking Regulations which apply to the use, operation and parking of all motor vehicles within the boundaries of the campus are established by the Board of Governors. It is the responsibility of all students to make themselves aware of the regulations, copies of which are available at the Parking Services located in the Art Workshop I.

Any person may apply to register a motor vehicle for a parking permit. Parking permits will be issued in accordance with the priorities set forth in the Traffic and Parking Regulations.

Visitors, and any persons who do not have a parking permit affixed to their vehicles, are limited to parking in zones designated as visitors parking zones and in metered stalls. Parking in any other zones or stalls is a violation of the regulations. Traffic tickets are issued for violations. An appeal procedure exists through which persons may appeal parking tickets to the Parking Appeals Committee (a committee of General Faculties Council). The Traffic and Parking Regulations should be consulted in such cases.

Public transportation to the campus is operated by the Edmonton Transit System and bus passes may be obtained by students at reduced rates during the University session. These passes are on sale after registration and immediately before and after Christmas vacation.

Parking Services is situated on the second floor south of Art Workshop I. (Telephone 432-2236).

19 STUDENT CONDUCT AND DISCIPLINE

19.1 General Information

When students enter the University, it is expected that they will apply themselves to their studies and conduct themselves with propriety and in conformity with the Code of Student Behavior. Should a student fail to live up to these expectations, the University reserves the right to take such action as, in its opinion, the case warrants.

Any person believing that a student has committed an offense, other than an academic offense, against University rules may, by a statement in writing delivered to the Officer responsible for Disciplinary Procedures (the Executive Assistant to The President), require the Officer to prepare and serve a charge upon such student. University Disciplinary Panels (consisting of three persons of whom two are students) have been established to hear such charges. Appeals from Panel decisions may be made to a University Appeal Board of like composition. The Disciplinary Panels, by delegation of authority from General Faculties Council, are empowered to fine students, to suspend, or to expel. In cases of academic dishonesty, such as plagiarism, the complaint is made in the first instance to the student's instructor. If the offense is serious it will be referred to the dean of the student's faculty who may in turn refer the complaint to the Executive Assistant to The President for consideration by a University Disciplinary Panel. A student may appeal the decision of his or her instructor or dean.

The Students' Union deals with matters of student discipline coming within its purview. For this purpose it has set up a Discipline, Interpretation and Enforcement Board. Appeal from rulings of this Discipline Board or the Lister Disciplinary Committee is to the University Appeal Board.

The assistants to the dean in residence, in conjunction with the elected student committees in the residences, are responsible for the supervision of conduct in the halls of residence.

There is also a Dean of Students who is prepared to assist students in disciplinary matters.

A student who feels he or she has a legitimate grievance that has not been adequately dealt with through other channels, has the right to petition any of the governing bodies of the University through the President of the University.

19.2 Code of Student Behavior

(As approved by G.F.C on September 29, 1980)

PART I *Amendment of the Code*

1. The Code may be amended by General Faculties Council in exercise of the authority vested in it by § 39 of the Universities Act.

2. The Code must be published in each issue of the University Calendar and on at least one occasion annually in the *Gateway*.

3. Amendments to the Code shall come into force only upon being published with the Code in its entirety on at least one occasion during each session prior to the appearance of the University Calendar which contain the amendments. Such publication shall take place in the *Gateway* or in another publication having wide circulation on Campus.

4. The Executive Assistant to the President shall maintain the Official Copy of the Code and all amendments thereto.

PART II *Offences*

Any of the following activities or conduct or attempts thereat or participation therein shall constitute an offence and be punishable:

1. Cheating, plagiarism, fraud, deceit, or other forms of *academic* dishonesty.

2. Subjecting any person to physical or mental indignity, injury, or violence.

3. Disturbing, disrupting, or otherwise interfering with studies, laboratories, lectures, work, or other lawful activities of fellow students or staff.

4. Intentionally damaging, destroying, or moving without authority or permitting to be damaged, destroyed or moved without authority, the property of the University, or of any student or staff member.

5. Unauthorized use of University property or property within the University, or use of or entry on such property in an unauthorized manner.

6. Raiding or unlawful entry of University residences or areas thereof.

7. Smoking during classes, laboratories and examinations.

8. Tampering with or misusing of fire or safety equipment including signs and notices.

9. Participation in unauthorized hazardous activities on Campus.

10. Failure to obey the lawful instructions of any University official or employee acting in the performance of his or her duty and failure to obey all published or posted regulations relating to the use and entry of University buildings and facilities.

11. Failure to provide identity at the request of a University official or employee acting in the course of his or her duty where:

a. the University official or employee finds the student committing an offence

or

b. the University official or employee has reasonable and probable grounds to believe that an offence has been committed or is about to be committed.

12. Initiation ceremonies involving physical violence, hazing or personal indignity.

13. Failure to obtain approval, permission or to otherwise follow procedures where required under *Administrative Requirements,* Part IV of the Code.

PART III *Penalties*

In the case of a breach of Part II of the Code of Student Behaviour the following penalties may be imposed at the discretion of the Disciplinary Panel or Appeal Board (43.3.7):

1. *Breach of section 1*
a. Expulsion
b. Suspension
c. Reprimand
d. Academic probation
2. *Breach of sections 2, 3, 4, 5, 6, 8, 9 and 12*
a. Expulsion
b. Suspension
c. Fine of not more than $200.00
d. Reprimand
e. Exclusion from specified areas of the University
3. *Breach of sections 10 and 11*
a. Fine of not more than $100.00
b. Reprimand
4. *Breach of sections 7 and 13*
a. Fine of not more than $25.00
b. Reprimand

PART IV *Administrative Requirements*

In the following sections applications may be conditionally granted or refused.

All applications for approvals to engage in the following activities must be made in writing and shall be approved or rejected with written reasons attached:

1. The outdoor use of public address systems, loud-speakers, bull horns, or sound trucks on the Campus of the University is not permitted without the prior approval in writing of the Vice-President (Facilities and Services). An appeal shall lie to the President. (City ordinances apply on the peripheral streets).

2. The use of the name of the University or the crest or coat of arms of the University, or of a University club or organization on any publication without the approval of the President is prohibited. An appeal shall lie to the Chairman of the Board of Governors.

(Note: As a matter of policy the President will not grant such approval to anonymous publications).

3. The unauthorized use of, bringing in, or possession of liquor on University premises, is prohibited. Liquor permits are issued by the Office of Student Affairs and each case will be treated individually on its merits. An appeal from such decisions shall lie to the Vice-President (Finance and Administration).

NOTE: For information about liquor permits and liquor regulations in the *Residences,* refer first to the Office of the Director of Housing and Food Services. For information about liquor regulations in *HUB,* apply first to the Office of the HUB Manager. For information about liquor regulations and permits relating to *other areas of the University,* apply directly to the Office of Student Affairs.

University clubs, while legally independent from the University in their financing and other arrangements, are nontheless required to register with the University through the Office of Student Affairs in order to ensure that the club accepts its share of responsibility for protecting the property and good name of the University. In return a University club receives certain privileges, including the right to call itself a University of Alberta club, to ask for a place in the year's schedule of events, to apply for rooms and other facilities on Campus, to request that its notices be published in the *Gateway,* and to be listed in the *Student Handbook.*

5. In order to obtain an excused absence from examinations, tests and other academic requirements. Off-Campus trips by individuals, groups and teams representing student organizations must be approved by the Dean of Physical Education and Recreation or his designee in the case of athletic matters and by the Deans' Council or its designee in all other cases. An appeal shall lie from a decision of the Dean of Physical Education and Recreation to the Vice-President (Academic).

6. Permission for the showing of films on Campus, except for those used as part of the academic or academic related programs, must be obtained from the Vice-President (Facilities and Services) who may make regulations from time to time for the aforementioned purpose in conformity with the Alberta Amusements Act and other applicable provincial legislation. An appeal shall lie to the President.

7. University individuals, groups and organizations may advance a cause and distribute or sell related literature or other similar material:

(a) in designated Activity Zones provided the use of the Zones has been reserved in advance with the Vice-President (Facilities and Services). An appeal shall lie to the President.

(b) in the areas other than Activity Zones with the prior approval of the Dean or other administrative officer or committee in charge of the area. An appeal shall lie to the Vice-President (Academic).

8. Canvassing and soliciting are forbidden on the Campus of the University. Exceptions may be made only by the Vice-President (Facilities and Services). An appeal shall lie to the President.

PART V *Administrative Information*

1. University Clubs, organizations, or individuals sponsoring functions on or off-Campus are responsible for maintaining discipline and enforcing liquor and other regulations on the premises where the functions are being held.

(Note: For duties of the Campus Security Services, see the Office of the Vice-President (Facilities and Services)).

2. University clubs, organizations or individuals wishing to invite the general public to on-Campus events or to sponsor off-Campus speakers are responsible for so informing the President's Office and for making related arrangements including space reservations, protection of persons and property, and payment of any related costs.

(Note: Additional information may be obtained from the Vice-President (Facilities and Services).)

3. All students living in or attending at a University residence are subject to the rules and regulations of that residence. Rules and regulations in force including any amendments are posted at the business office of the residence, or in the areas affected.

4. All persons owning, operating or parking vehicles on University property are subject to the current Traffic and Parking Regulations of The University of Alberta. Information about Traffic and Parking Regulations in force, including any amendments, may be secured from the Parking Supervisor's Office.

5. Persons desiring to carry on commercial activity on property under the government and control of the Students' Union should obtain permission from the Students' Union.

6. The University of Alberta comes under the purview of the Alberta Fire Prevention Act, R.S.A. 1970 c. 115 and the regulations therein. The University of Alberta Board of Governors has approved and adopted a University Fire and Safety Code that is applicable to students, staff and visitors.

7. Members of the University community may put up posters and notices on "open" notice boards as long as the posters and notices do not create a nuisance. Enquiries concerning other displays or signs on University property should be directed to the Dean of Students. Notices may not be affixed to trees or shrubs. The Libraries, food service areas, the Administration Building, and University Hall are to be kept free of any but official notices.

8. By agreement with the Edmonton Musicians Protective Association, orchestras organized and playing on Campus need not consist wholly of Association members, but all orchestras brought in to play for University functions must be made up of Association members. For further information students should contact the Secretary of the Edmonton Musicians Protective Association.

9. The Campus Law Review Committee reviews the rules and regulations of the University relating to student disciplinary matters on a continuing basis. Members of the University community have the right to speak to and make representations concerning the above at any duly constituted C.L.R.C. meeting.

Agriculture and Forestry Centre

Faculty of Agriculture and Forestry

31 INTRODUCTORY

31.1 Members of the Faculty

31.1.1 OFFICERS OF THE FACULTY

Dean
J. P. BOWLAND, Ph.D.

Associate Deans
J. B. McQUITTY, M.Sc. (Planning and Development)
P. J. MURPHY, M.Sc.F. (Forestry)

Administrative Officer
L. N. STRAFFORD, B.Sc.Ag.

31.1.2 DEPARTMENT OF AGRICULTURAL ENGINEERING

Professor and Chairman
B. T. STEPHANSON, M.Sc. (Power, Machinery and Materials Handling, and Processing)

University Professor
F. V. MacHARDY, Ph.D. (Economics of Mechanization and Renewable Resource Energy)

Professors
K. W. DOMIER, Ph.D. (Power and Machinery)
H. P. HARRISON, Ph.D. (Farm Machinery)
J. B. McQUITTY, M.Sc. (Farm Buildings)
T. A. PRESTON, M.A. (Work Study, Production and Industrial Engineering, Operations Research)
E. RAPP, M.Sc. (Soil and Water)

Associate Professors
A. W. ANDERSON, M.Sc. (Operations Research)
E. G. A. GRIMMER, B.Sc.F. (Forest Engineering)

Assistant Professor
M. MICKO, Ph.D. (Wood Science)

31.1.3. DEPARTMENT OF ANIMAL SCIENCE

Professor and Chairman
R. T. BERG, Ph.D. (Animal Genetics)

Professors
F. X. AHERNE, Ph.D. (Swine Production)
J. P. BOWLAND, Ph.D. (Animal Nutrition, Swine)
R. T. HARDIN, Ph.D. (Poultry Genetics)
L. P. MILLIGAN, Ph.D. (Animal Biochemistry)
A. R. ROBBLEE, Ph.D. (Poultry Nutrition)
B. A. YOUNG, Ph.D. (Animal Physiology)

Associate Professors
R. J. CHRISTOPHERSON, Ph.D. (Animal Physiology)
R. J. HUDSON, Ph.D. (Wildlife Management and Productivity)
G. W. MATHISON, Ph.D. (Animal Nutrition, Beef Cattle)
M. A. PRICE, Ph.D. (Livestock Growth and Meat Production)
J. R. THOMPSON, Ph.D. (Meats Biochemistry)

Assistant Professors
J. J. KENNELLY, Ph.D. (Dairy Production)
W. C. SAUER, Ph.D. (Swine Nutrition)
A. SHIRES, Ph.D. (Poultry Nutrition)

Administrative Officers
H. CAMPBELL, B.Sc.Ag.
A. STEPHEN

Faculty Service Officer
B. KERRIGAN

31.1.4 DEPARTMENT OF ENTOMOLOGY

Professor and Chairman
G. E. BALL, Ph.D. (Systematics, Morphology, Evolution, Zoogeography)

Professors
D. A. McB. CRAIG, Ph.D. (Morphology, Histology)
W. G. EVANS, Ph.D. (Ecology, Behavior)
R. H. GOODING, Sc.D. (Insect Biochemistry, Medical Entomology)
B. S. HEMING, Ph.D. (Morphology, Development)

Associate Professor
B. K. MITCHELL, Ph.D. (Physiology, Behavior)

Assistant Professor (NSERC Fellow)
J. R. SPENCE, Ph.D. (Ecology Systematics)

Administrative Officer
E. J. ANDREWS

31.1.5. DEPARTMENT OF FOOD SCIENCE

Professor and Chairman
H. JACKSON, Ph.D. (Food and Industrial Microbiology)

Professors
D. HADZIYEV, Ph.D. (Food Chemistry)
F. H. WOLFE, Ph.D. (Food Chemistry)

Associate Professors
P. JELEN, Ph.D. (Food Processing)
M. LeMAGUER, Ph.D. (Food Engineering)

Assistant Professors
E. D. JACKSON, Ph.D. (Food Microbiology)
B. OORAIKUL, Ph.D. (Food Processing)
P. SPORNS, Ph.D. (Food Chemistry)

Honorary Academic Staff
G. L. GALL, LL.B. (Law)
L. E. McGANN, Ph.D. (Cryobiology)
D. J. SCHRODER, Ph.D. (Food Processing, Food Microbiology)

Administrative Officer
D. C. PARADIS, M.Sc. (Food Science)

31.1.6. DEPARTMENT OF FOREST SCIENCE

Professor and Chairman

P. J. MURPHY, M.Sc.F. (Forest Recreation, Forest Policy and Administration, Forest Fire Control and Use)

Associate Professors

J. A. BECK, Ph.D. (Forest Resources Management and Economics)
B. P. DANCIK, Ph.D. (Dendrology and Forest Tree Improvement)
J. D. HEIDT, Ph.D. (Outdoor Recreation and Resource Economics)
A. K. HELLUM, Ph.D. (Silviculture)
K. O. HIGGINBOTHAM, Ph.D. (Forest Ecology and Tree Physiology)
R. L. ROTHWELL, Ph.D. (Forest Hydrology)

Assistant Professors

J. R. BUTLER, Ph.D. (Wildland Recreation, Management and Planning, Environmental Education)
S. J. TITUS, Ph.D. (Resource Measurements and Mensuration)
P. M. WOODARD, Ph.D. (Forest Fire Management)

Associate Academic Staff

J. D. CAMPBELL, Ph.D. (Paleoclimatology and Dendrochronology)
F. C. YEH, Ph.D. (Forest Genetics)

Administrative Officer

H. D. WALKER, B.Sc.F.

31.1.7. DEPARTMENT OF PLANT SCIENCE

Professor and Chairman

W. P. SKOROPAD, Ph.D. (Plant Diseases)

Professors

W. T. ANDREW, Ph.D. (Vegetable Crops)
A. W. BAILEY, Ph.D. (Range Ecology and Management)
K. G. BRIGGS, Ph.D. (Plant Breeding)
N. COLOTELO, Ph.D. (Host-Parasite Relationships)
C. HIRUKI, Ph.D. (Virology)
R. H. KNOWLES, M.Sc. (Landscape Architecture, Turf, Woody Ornamentals and Fruit Crops)
Z. P. KONDRA, Ph.D. (Plant Breeding)
M. S. SPENCER, Ph.D. (Plant Biochemistry)
W. H. VANDEN BORN, Ph.D. (Herbicides and Weed Physiology)
P. D. WALTON, Ph.D. (Plant Breeding)
S. ZALIK, Ph.D. (Plant Physiology and Biochemistry)

Associate Professor

E. W. TOOP, Ph.D. (Floriculture)

Assistant Professors

E. A. CLARK, Ph.D. (Pasture Management)
A. HORAK, Ph.D. (Plant Physiology)

Administrative Officer

V. L. CLARKE

31.1.8 DEPARTMENT OF RURAL ECONOMY

Professor and Chairman

M. L. LEROHL, Ph.D. (Farm Management, Agricultural Policy)

Professors

L. P. APEDAILE, Ph.D. (Econometrics, Rural Development)
L. BAUER, Ph.D. (Farm Management and Production Economics)
D. S. GILL, Ph.D. (Rural Sociology, Agricultural Extension)
M. H. HAWKINS, Ph.D. (Marketing, Business Management)
T. W. MANNING, Ph.D. (Marketing, Natural Resources Economics)
T. A. PETERSEN, Ph.D. (Farm Management, Extension)
W. E. PHILLIPS, Ph.D. (Econometrics, Natural Resources Economics)
J. J. RICHTER, Dr.Rer.Pol. (Marketing and Trade)
W. M. SCHULTZ, Ph.D. (Finance, Production Economics)
M. M. VEEMAN, Ph.D. (Marketing)
A. A. WARRACK, Ph.D. (Economic Theory, Marketing Policy)

Associate Professors

M. R. CARROLL, Ph.D. (Forestry Economics)
D. G. MURRI, M.S. (Rural Sociology)
T. S. VEEMAN, Ph.D. (International Development, National Resources, Economics)

Administrative Officer

R. R. NORBY, M.Sc.

31.1.9 DEPARTMENT OF SOIL SCIENCE

Associate Professor and Chairman

W. B. McGILL, Ph.D. (Soil Biochemistry)

Professors

F. D. COOK, Ph.D. (Soil Microbiology)
M. P. K. NYBORG, Ph.D. (Soil Fertility)
S. PAWLUK, Ph.D. (Soil Genesis and Classification)
J. A. ROBERTSON, Ph.D. (Soil Chemistry)
G. R. WEBSTER, Ph.D. (Soil Chemistry)

Associate Professors

P. H. CROWN, Ph.D. (Remote Sensing and Land Use)
M. J. DUDAS, Ph.D. (Soil Classification and Mineralogy)
D. J. PLUTH, Ph.D. (Forest Soils and Land Use)

Assistant Professor

D. S. CHANASYK, Ph.D. (Soil Physics)

Associate Academic Staff

G. M. COEN, Ph.D. (Soil Genesis and Chemistry)
W. W. PETTAPIECE, Ph.D. (Soil Genesis and Mineralogy)

Administrative Officer

M. E. YOHEMAS

31.1.10 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor

M. HOROWITZ, Ed.D.

Professors

M. G. FAULKNER, Ph.D. (Mechanical Engineering)
G. W. LAMBLE, M.Sc. (Extension)
J. A. LEJNIEKS, Ph.D. (Political Science)
M. J. ROBINS, Ph.D. (Chemistry)

Associate Professors

J. L. B. GAMLEN, Ph.D. (Mathematics)
J. HODDINOTT, Ph.D. (Botany)
W. M. SAMUEL, Ph.D. (Zoology)

Representatives

K. C. DAVIES, B.Sc. Ag., Alberta Institute of Agrologists
W. R. DEMPSTER, Ph.D., Canadian Institute of Forestry
B.Sc. Agricultural Engineering — one student representative
B.Sc. Agriculture—five student representatives

B.Sc. Food Science — one student representative
B.Sc. Forestry—three student representatives
Graduate Studies and Research—two student representatives

Registrar of the University
W. A. BLANCHARD, Ph.D.

31.2 General Information

The Faculty of Agriculture was established at the University of Alberta in 1915 and the first students to receive the degree of Bachelor of Science in Agriculture (B.S.A.) graduated in 1918. The present B.Sc. degree was first given in 1924. A Forestry program leading to the B.Sc. degree was authorized in 1970. The first students registered in this program commenced studies in the fall term of the 1970-71 academic year. The first degrees in Forestry were granted in April 1974.

The four-year programs in Agriculture and Forestry are professional ones, providing education in many facets of the science of agriculture and forestry. The Faculty has under its direct administration the Departments of Agricultural Engineering, Animal Science, Entomology, Food Science, Forest Science, Plant Science, Rural Economy and Soil Science. Many of the courses which are fundamental to the science of agriculture and forestry are given in other departments of the University, since the underlying scientific principles are the same as in any other field. It is the function of the departments in this Faculty to apply these principles to the solution of agricultural and forestry problems and to seek, through research, new information.

A modified first year in Agriculture or Forestry may be taken at The University of Calgary, or one of the affiliated Junior Colleges.

The second, third and fourth years in Agriculture or Forestry are offered at The University of Alberta only.

A four-year cooperative program is offered in Agricultural Engineering leading to a B.Sc. (Agr. Eng.) See § 33.2.

A four year interdisciplinary program is offered in Food Science leading to the degree of B.Sc. (Food Science). See § 33.3.

Two years of pre-Veterinary Medicine may be taken at The University of Alberta with a view to application for admission to the four-year program in Veterinary Medicine at the Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon. (See special program, § 33.5 below.)

The departments in the Faculty also offer advanced degrees, and carry on extensive programs of research. The Departments of Agricultural Engineering, Animal Science, Entomology, Forest Science, Plant Science, and Soil Science operate off-campus facilities used in the teaching and research programs of these Departments. All departments have space and facilities for laboratory research.

Agricultural graduates are engaged in teaching, research, extension, and administrative work related to agricultural production, marketing, and processing; in the manufacture and distribution of such essentials as feeds, fertilizers, and machinery; in the handling of agricultural products; and in farming. In recent years an increasing number of agricultural industries have offered attractive opportunities for graduates of this program.

Forestry graduates are employed by the Federal and Provincial Governments and by industries associated with the production and marketing of forest products.

32 FACULTY REGULATIONS

32.1 Admission

Detailed admission requirements of the Faculty of Agriculture and Forestry are set out in § 13.1 and 13.3 of the University Regulations and Information for Students Calendar. However, students should note that commencing September, 1978, the number of applicants admitted to the first year of programs offered by the Faculty was limited by a quota. Consequently, it may not be possible to admit all who meet the minimum requirements. The Faculty will also consider for acceptance non-matriculated students of 21 or over, providing they are interviewed and given a satisfactory recommendation by Student Counselling Services.

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms: 1. successful completion of the equivalent of three years of full-time instruction in an English language secondary instituition in Canada; 2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta; 3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta; 4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or 5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six

Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

32.2 Academic Standing

(1) The Faculty of Agriculture and Forestry makes use of the "Performance Index" (P.I.) system for gauging academic performance. This is obtained by multiplying grade point average by the number of full course equivalents passed. Performance Index is related to academic performance as follows:

Category A—P.I. 20.0 or greater — Satisfactory
Category B—P.I. 10.1 to 19.9 — Unsatisfactory
Category C—P.I. 10.0 or less — Unsatisfactory — required to withdraw

Subject to quota limitations category A and B students may continue in their program. Category B should be interpreted as an indication that improved performance is necessary for graduation.

Category C students will normally be required to remain out of The University of Alberta for one year. Re-admission to the Faculty of Agriculture and Forestry is dependent upon a favorable recommendation from Student Counselling Services.

(2) In order to be eligible for graduation students must obtain a 5.0 grade point average or better in ten full-session course equivalents taken during their third and fourth years.

In cases where more than 10 full-session course equivalents were taken in the last two years, the grades from all courses taken in the last year will be used in the G.P.A. calculation and additional courses will be selected from the previous year to make up the 10 course requirement. The courses selected from the previous year will be those with the highest grades.

In cases where fewer than 10 full-session course equivalents were taken in the last two years, the grades from all courses taken in the last two years will be used in the G.P.A. calculation, and additional courses will be selected from the previous year to make up the 10 course requirement. The courses selected from the previous year will be those with the highest grades.

(3) Students should note that for the purposes of scholarships and awards, the Faculty defines "First Class Standing" as a grade point average of 7.5 or better on not less than 27 units of course weight during the regular academic session, or on not less than 15 units if the student is in attendance for only a single term; and, "With Distinction" as a grade point average of 7.5 or better on the last 60 units of course weight with the G.P.A. being calculated in the same way as determination of the G.P.A. required for graduation (see #2 above).

(4) In any year, a student will not be allowed to write supplemental examinations in more than two full-session courses, or equivalent. During the entire program, students will not be allowed to write supplemental examinations in more than three full-session courses, or the equivalent, whether for the purpose of obtaining passing marks or of raising their average to the required level.

(5) The Faculty of Agriculture and Forestry does not grant conceded credit for grades of three. As with all regulations, the Executive Committee will consider appeals if a student has extenuating circumstances which warrant such consideration. Students would be required to submit their appeals in writing to the Executive Committee during or at the end of the academic year in which the grade of three was obtained.

NOTE: Students are reminded that for admission to a course with a prerequisite requirement, a grade of at least 4 must be obtained in the prerequisite course.

32.3 Curriculum and Graduation

(1) The program for the B.Sc. degrees in Agriculture and Forestry must conform to the descriptions in § § 33.1 and 33.4 respectively. All students must obtain approval for their programs from their program advisor. Students are reminded, however, of the regulation that the student is responsible for the completeness and accuracy of his or her registration.

(2) The Faculty may, for adequate reasons, permit students to register in more or fewer courses in a given academic year than their program normally entails. This may result in decreasing or increasing the length of time for graduation. *Students wishing to take more than six courses per term must obtain the written approval of the Dean.*

(3) Students registered in degree programs in the Faculty must have successfully completed a minimum of 20 full-session course equivalents. Students who register for more than the minimum number of courses for graduation must designate the additional courses as extra. *In order to exclude courses in excess of the minimum requirement from the contract for graduation, the student must designate such courses as "extras" at the time of registration for the final year.*

In addition, (i) students registered in the B.Sc. Agriculture program are required to complete Agriculture and Forestry 404, *Field Trip* (normally between the second and third year) and Agriculture and Forestry 451, *Professional Agriculture;* (ii) students registered in the B.Sc. Forestry program are required to complete Forest Science 301, *Forestry Field Camp.*

32.4 Withdrawal from Courses

Withdrawal from individual courses can be arranged through the Dean's Office in consultation with the program advisor. Applications for withdrawal should be made according to the deadlines listed in the Academic Schedule (§ 11).

32.5 Transfer from Other Programs

Students transferring into any B.Sc. program offered by the Faculty (regardless of whether they are transferring from other programs offered by the Faculty, other faculties of The University of Alberta, or other colleges or universities) must meet all of the requirements of the program in which they are registered in addition to meeting the residence requirements of The University of Alberta. Students in the Faculty of Agriculture and Forestry will not normally be permitted to register in any two degree programs simultaneously.

32.6 Holders of Previous Degrees

Holders of previous degrees registering in a B.Sc. program offered by the Faculty must meet all of the requirements of that program. Holders of four-year de-

grees will be required to complete a minimum of nine full-session course equivalents with a G.P.A. of at least 5.0. Holders of three-year degrees will be required to complete a minimum of fourteen full-session course equivalents, with a G.P.A. of at least 5.0 in ten full-session course equivalents normally taken during the last two years of the program.

32.7 Students from Alberta Agricultural and Vocational Colleges

Students who present the College Diploma from an Alberta Agricultural and Vocational College, and who obtain a grade point of 2.7 or higher on the 4-point system, may receive credit for up to six single-term courses in Agriculture in recognition of collective experience and performance in the Agriculture Colleges. These course credits are to be from among the 200 and 300 level courses of the Faculty and will be determined by the Dean upon recommendation by the student's program advisor.

32.8 Students from Institutes of Technology

Graduates from related programs at Institutes of Technology may be granted some advance placement or transfer credit upon the recommendation of the advisor in the student's program.

32.9 Appeal Procedures

Students who wish to appeal decisions related to academic and program requirements should first discuss the problem with the Dean. Should students not be satisfied they may appeal in writing to the Executive Committee of the Council of the Faculty of Agriculture and Forestry. In the event of an unsatisfactory appeal to the Executive Committee, the student has, in specified situations, the right of appeal to the General Faculties Council Academic Appeals Committee. (See § 16.7 of the University Regulations and Information for Students Calendar.)

33 PROGRAMS OF STUDY

33.1 The Degree of B.Sc. in Agriculture

33.1.1 GENERAL INFORMATION

(1) The Faculty offers courses leading to the degree of Bachelor of Science in Agriculture.

(2) A number of courses are specified as required during the first year. Students may select the remainder of their first year courses in consultation with a student advisor.

(3) Beginning in the second year, students may follow a general program providing a broad training in agriculture or a specialized program in one of several fields of agriculture. Course selection should be arranged in consultation with an advisor in the area of specialization. Students registered in the general program may select their courses in consultation with a member of the General Program Advisory.

(4) Students entering their third year who plan to follow a departmental specialization must consult the department in which they plan to specialize, and it is highly desirable for them to work out a tentative program for both their third and fourth years at this time. Their program must be approved by their program advisor before they can register.

Students whose records to date would qualify them for graduate studies (a grade-point average of 6.0 or better) may register in a more specialized program in the department in which they ultimately plan to undertake graduate study. Such a program must be approved in advance by the department of specialization and by the Dean.

(5) Students in the second, third and fourth years may always obtain guidance and assistance in selecting and registering for their courses from their program advisors. The Dean of the Faculty will be pleased to confer with students at any time.

(6) Students entering the third year will be charged a fee to cover living expenses related to the three-day field trip during registration week. This trip normally involves a bus tour of various agricultural industries located in Alberta and is one of the program requirements.

33.1.2 COURSES REQUIRED IN THE B.SC. AGRICULTURE PROGRAM

(1) First Year Requirements:

AGFOR 201 / 204
One of BIOL 296 / 297 / 298 / 299, INT D 230
CHEM 202 or 250
ECON 201 / 202
ENGL 215
MATH 202 (or 203)
MATH 204 or STAT 241

NOTE: These courses must be taken in first year. Students transferring from other programs or institutions will be required to complete all of the above courses in which they are deficient during their first year in attendance in the B.Sc. Agriculture program at The University of Alberta. Courses not successfully completed must be repeated.

NOTE: Students entering without the appropriate Grade 12 prerequisites for the above courses should consult with the Dean's Office regarding their first year requirements.

(2) In addition to those courses listed above, students must complete two full-session course equivalents from outside the Faculty in the biological, social or physical sciences during the balance of their degree program.

(3) Students specializing in a departmental major are required to take courses in at least three departments of the Faculty other than the department in which they are specializing, and they must take at least six single-term courses or their equivalent in those departments.

(4) Agriculture and Forestry 404, *Field Trip,* — normally taken between second and third years. Requests for deferment to fourth year must be made in writing to

the Dean of Agriculture and Forestry before July 1 of the appropriate year.

(5) Agriculture and Forestry 451, *Professional Agriculture,* — normally taken by students during their fourth year.

NOTE: § 33.1.3 Reserved.

33.1.4 MODIFIED FIRST YEAR AT THE UNIVERSITY OF CALGARY, THE UNIVERSITY OF LETHBRIDGE, AND ELSEWHERE

Students at The University of Calgary, The University of Lethbridge, and at affiliated junior colleges may take a modified first-year Agriculture program. The second, third and fourth years of the Agriculture program are offered only at The University of Alberta.

Details of the modified first year program are available in the Calendars of these institutions.

33.1.5 GENERAL PROGRAM

Students entering their second year who plan to follow the general program should consult the General Program Advisory of the Faculty. To meet the General Program requirements they must take a minimum of two single-term courses in each of the Departments of Animal Science, Plant Science, Rural Economy, and Soil Science, one single-term course in the Department of Agricultural Engineering, and at least three additional single-term courses from within the Faculty.

33.1.6 SPECIALIZATION IN AGRICULTURAL ECONOMICS OR RURAL SOCIOLOGY

The Department of Rural Economy offers specialized programs in Agricultural Economics, Forest Economics, or Rural Sociology. Concentrated programs are available in farm and ranch management, marketing, natural resources, and rural development. Every assistance will be provided to students wishing to pursue commodity-oriented programs, such as in livestock and poultry, as well as to students wishing to pursue service oriented programs such as extension. Information on course electives, curricula, and prerequisites for graduate studies may be obtained from the Department.

Agricultural Economics Specialization. The following courses are required in addition to the Faculty requirements (see § 33.1.2): Agricultural Economics 315 and 316, Rural Sociology 355, and 20 single-term courses of electives (including six in agricultural economics, one in accounting, two in economic theory, and two in any social science). It is recommended that students take four of the following five courses in their second and third years; Agricultural Economics 333, 373, 384, Interdisciplinary Studies 302 and 365.

The following electives are recommended especially for students interested in graduate studies: Agricultural Economics 416, Economics 481 and 482.

Rural Sociology Specialization. The following courses are required in addition to the Faculty requirements (see § 33.1.2): Interdisciplinary Studies 356, Agricultural Economics 315 and 373, Rural Sociology 355, and 19 single-term courses of electives (including four in rural sociology, and two in any social science).

33.1.7 SPECIALIZATION IN AGRONOMY

This specialization deals with the theory of plant-soil relationships and the practice of field-crop production.

The following courses must be taken in the program in addition to required Faculty courses (§ 33.1.2):

(1) Agricultural Economics 333 and one of Agricultural Economics 384 or Interdisciplinary Studies 302 or 303

(2) Agricultural Engineering 305

(3) Animal Science 372

(4) Biology 297

(5) Chemistry 202 and 250 (or 350)

(6) Entomology 207

(7) Microbiology 315 (or 201)

(8) Plant Science 352, 354, 355, 380, 381, 400, 465

(9) Soil Science 310, 360, 420, plus two from among Soil Science 430, 460, 470, 485

(10) Electives should be selected from a list available from the Program Committee, and must be approved by a member of the Committee.

33.1.8 SPECIALIZATION IN ANIMAL OR POULTRY SCIENCE

Organic Chemistry (Chemistry 250 or equivalent) and Biology 297 or equivalent are requirements for those specializing in the Department of Animal Science and will also fulfill the Faculty requirements for chemistry and biology (see § 33.1.2). In addition, an introductory course in Biochemistry (Plant Science 431 or equivalent) is highly desirable. Students are advised to take their Biochemistry and Animal Physiology courses in their second year. Assistance on program choices is provided by the department.

LIVESTOCK MAJORS — A minimum of eight single-term 300-level or higher Animal Science courses is required. Of these, students must take at least one course in each of Animal Physiology, Animal Nutrition and Animal Breeding.

POULTRY MAJORS — A minimum of eight single-term 300-level or higher Poultry Science or Animal Science courses is required, four of which must be Poultry Science 352, 453, 459, and 462.

Electives—Approved electives to a total of at least eighteen single-term courses, or the equivalent, are required. These may include additional courses offered by the Department; normally they should include courses from three of the following areas: Agricultural Economics, Agricultural Engineering, Plant Science, and Soil Science. In addition, consideration may be given to including a course in Computing Science.

33.1.9 SPECIALIZATION IN ENGINEERING AGROLOGY

The Department of Agricultural Engineering offers an Engineering Agrology option in the B.Sc. Agriculture program as well as Forest Operations and Wood Utilization options in the B.Sc. Forestry program.

Engineering Agrology. The Engineering Agrology program is for students who wish to emphasize the biological and functional aspects of Agricultural Engineering. It is intimately associated with production agriculture activities. It involves a firm understanding of production agriculture emphasizing practical application of engineering principles. Economic principles and communication skills are important. The course is designed to give the student a firm foundation of basic science, a broad contact with agricultural disciplines and a core of agricultural engineering training.

First Year

Students are referred to §33.1.2 for first year requirements.

Second Year

Agricultural Engineering 202, 303. Computing Science 351, single-term elective.

Mathematics 204 or Statistics 241, Mathematics

243, or Agricultural Economics 316
Plant Science 215. Physics 212. Soils 310

Third and Fourth Years

Accounting 307
Agricultural Engineering 301, 302, 304, 313, 411, 420, 421, 456 and one other.
(Agricultural Economics 323, 423, Legal Relations 310) or (Agricultural Economics 333, 433 or 434, 435)
Two of Animal Science 300, 372 or 460
Microbiology 201 or 315
Plant Science 341, or 352 or 355
Soils 360, or 440 or 470
Two electives

A suggested timetable for the four years is available from the Department.

33.1.10 SPECIALIZATION IN ENTOMOLOGY

The specialization in entomology provides a comprehensive training in agricultural entomology. In addition to meeting the Faculty requirements listed in § 33.1.2, students are required to complete Entomology 207/302, Forest Science 380 (or Entomology 480), Entomology 392 (or 492), Entomology 407/427 and Entomology 471 (for one or two terms).

33.1.11 SPECIALIZATION IN FOOD SCIENCE

The Department of Food Science offers a program with the following course requirements (in addition to the Faculty requirements listed in § 33.1.2):

Biochemistry 300 or Plant Science 431/432, Chemistry 202/250, Food Science 200/351/383/461/471, Microbiology 315/365, and two single session electives in Food Science.

A double major combining Food Science with any other major program can be taken subject to the approval of the Chairman of the other department concerned.

Students desiring further information are invited to consult the Department.

33.1.12 SPECIALIZATION IN GRAZING MANAGEMENT

The student interested in this program may emphasize either range and pasture management or wildlife and range management. Students entering their second year who plan to follow the Grazing Management specialization must consult with the Grazing Management Program Co-ordinator; it is highly desirable for them to work out a tentative program for their second, third and fourth years at this time. They must take a total of at least twelve single-term course enquivalents from at least four departments of the Faculty. Their programs must be approved by the Program Co-ordinator.

In order to complete the program all students must take the following courses:

(1) Animal Science 460 and 461

(2) Biology 298; Interdisciplinary Studies 230 or Forest Science 315.

(3) Plant Science 356, 406 and 471

(4) Soil Science 310 and one of Soil Science 360, 420, 460 or Forest Science 314.

Students interested in range and pasture management are required to take Plant Science 354 and 472, Animal Science 477 and Agricultural Economics 333. Students interested in wildlife and range management are required to take Animal Science 351, Interdisciplinary Studies 365, an approved animal biology single-term course, and an approved Forest Science single-term course.

Courses and additional electives to complete the requirements of the program must be selected in consultation with the Grazing Management Program Co-ordinator.

Normally students would take at least Biology 298, Soil Science 310, and Interdisciplinary Studies 230 or Forest Science 315 during their first two years.

33.1.13. SPECIALIZATION IN PLANT PROTECTION

This specialization provides an interdisciplinary study of the theory and practice in plant protection. To complete the requirements of the program, students must take the following courses and must include the courses required by the Faculty of Agriculture and Forestry (§ 33.1.2).

— one of Agricultural Economics 333, 384, Forest Economics 345 or Interdisciplinary Studies 365
— Agricultural Economics 435
— Biology 297, 298, 299
— Botany 324
— Chemistry 302 or 350
— Entomology 207, 407, 476
— Interdisciplinary Studies 230
— Microbiology 315
— Philosophy 355 and an additional single term course in the Humanities
— Plant Science 215, 350, 352, 355, 380, 382, 400, 470
— Soil Science 310, 430

Electives should be selected from a list available from the Program Committee and must be approved by a member of the Committee.

33.1.14 SPECIALIZATION IN PLANT SCIENCE

Students may follow a program of general Plant Science or specialize in one of the following fields of study: Crop Ecology and Plant Breeding (including Range and Pasture Management and Weed Science); Horticulture (including Landscape Architecture); Plant Pathology; Plant Physiology and Biochemistry. Information on requirements and recommended course programs for the various specializations may be obtained from the Department.

In general, all Plant Science majors are required to take Interdisciplinary Studies 230, Plant Science 215, Soil Science 310, at least one of Biology 296/298/299/297 (or Genetics 351), and one full course each of inorganic and organic chemistry. Some of these courses will be met by the first year requirements as outlined in § 33.1.2. A minimum of nine additional single-term courses will be required depending upon the area within Plant Science in which the student chooses to specialize. These are set out in the Plant Science Undergraduate Course Guide.

33.1.15 SPECIALIZATION IN SOIL SCIENCE

The Department of Soil Science provides education in Soil Science with programs arranged in the areas of soil productivity and land management, irrigation and drainage, soil reclamation and conservation, soil classification and survey, and general soil science.

In addition to the Faculty requirements listed in § 33.1.2 the following are the minimum courses required for specialization in Soil Science:

Soil Science 310; Microbiology 315; a single-term course in geology; a single-term course in statistics (if

not taken as part of the Faculty requirements in first year); a full-year course in chemistry (in addition to the Faculty requirement) *OR* a full-year course in physics. These would nomrally be taken in second year.

At least one course in *each* of the following four areas is required; Soil Genesis and Classification (Soil Science 420); Soil Physics (Soil Science 440); Soil Biology (Soil Science 330 or 430); Soil Chemistry-Mineralogy (Soil Science 415 or 450). At least three (3) additional courses (excluding project courses) offered by the Department of Soil Science are also required. All of the foregoing would normally be taken during third and fourth years.

Interested students are invited to consult with the Department of Soil Science for a list of approved optional courses and further information before completing their program plans.

33.2 Cooperative B.Sc. Program in Agricultural Engineering

A four-year program in Agricultural Engineering is offered cooperatively by the Faculty of Agriculture and Forestry and the Faculty of Engineering. For details of the program see § 83.8 of the Faculty of Engineering Calendar.

The program is administered by a Joint Agricultural Engineering Curriculum Committee consisting of the Deans of the Faculty of Agriculture and Forestry and the Faculty of Engineering (or their representatives), the Agricultural Engineering Coordinator, the Chairman, Department of Agricutural Engineering or another member of the Department if the Chairman is also Coordinator, and two full time academic members selected by and from the Faculty of Engineering.

For administrative purposes students in the program will be registered in the Faculty of Agricuture and Forestry.

(1) *Admission.* The matriculation requirements are set out in § 13.3.1.

(2) *Promotion.* Promotion from year to year will be decided by the Joint Committee but in general the requirements for promotion will be the same as those of the Faculty of Engineering.

(3) *Graduation.* The Joint Committee will recomend approval of the candidate for the degree by the Council of the Faculty of Agriculture and Forestry .

(4) *Scholarship.* Details of scholarships for which students in the program are eligible are listed under the Faculty of Agriculture and Forestry and the Faculty of Engineering Awards sections of the Calendars.

ALL ENQUIRIES SHOULD BE DIRECTED TO THE DEAN OF THE FACULTY OF AGRICULTURE AND FORESTRY (TELEPHONE 432-4931) OR THE CHAIRMAN OF THE DEPARTMENT OF AGRICULTURAL ENGINEERING (TELEPHONE 432-4251).

33.3 Interdisciplinary B.Sc. Program in Food Science

A four-year interdisciplinary program in Food Science is offered co-operatively by the Faculties of Agriculture and Forestry, Home Economics, and Science. It allows students to specialize in this expanding field more than is possible in the specialized program in Food Science offered by the Faculty of Agriculture and Forestry.

The program is administered by an Interdisciplinary Committee consisting of the Deans of the Faculties of Science and Agriculture and Forestry (or their representatives), the Dean and a faculty member of the Faculty of Home Economics, the Chairman of the Department of Food Science and a Faculty member, and two undergraduate students. The Chairman of the Department of Food Science acts as the Co-ordinator of the program. Students in the program are, for administrative purposes, registered in the Faculty of Agriculture and Forestry.

The outline of the program is as follows:

First Year: Chemistry 202; Chemistry 250; Mathematics 240 (or 242); Food Science 200; English 215 or Agriculture and Forestry 204; one and one-half full-session approved options. NOTE: Students lacking Biology 30 must take Biology 130.

Second Year: Biochemistry 300; Microbiology 315 and 365; Physics 203 (or 205) and 207; Statistics 241; Food Science 351 and 383; one-half full-session approved option.

Third Year: Chemistry 312; Food Science 402, 453 and 454, 461, 471, and one and one-half full-session approved options.

Fourth Year: Foods and Nutrition 464 and 465; and four full-session approved options. NOTE: At least one and one-half of the approved options must be taken in Food Science.

The following points should be noted:

(1) *Admission.* The program is designed so that students may register in it immediately upon entering university or may transfer from the Faculties of Agriculture and Forestry, Home Economics, or Science after their first or possibly after their second year. The matriculation requirements for those entering the program from high school are set out in § 13.3.2 of the University Regulations and Information for Students' Calendar.

(2) *Promotion.* Promotion from year to year will be decided by the Interdisciplinary Committee, but in general the requirements for promotion will be similar to those of the Faculty of Agriculture and Forestry.

(3) *Graduation.* The Interdisciplinary Committee will recommend approval of the candidate for the degree by the Council of the Faculty of Agriculture and Forestry.

(4) *Scholarships.* Details of scholarships for which students in the program are eligible are listed under the Faculty of Agriculture and Forestry in the Awards section of the Calendar.

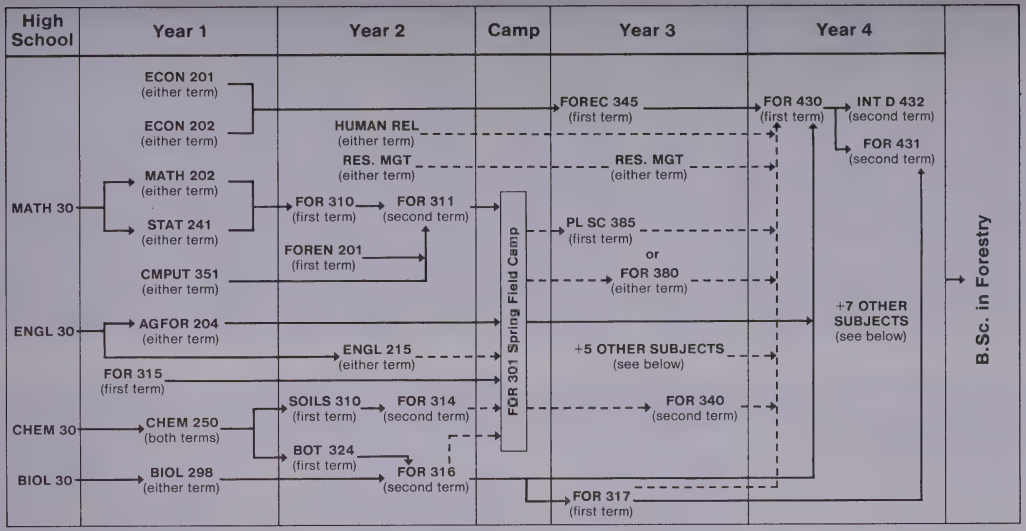
All enquiries should be directed to the Dean of the Faculty of Agriculture and Forestry or the Chairman of the Department of Food Science.

33.4 The Degree of B.Sc. in Forestry

33.4.1 GENERAL INFORMATION

(1) The Faculty offers courses leading to the degree of Bachelor of Science in Forestry. The program consists of four years of university study with a yearly load of ten single-term course equivalents. In addition, a five-week spring field camp is required.

(2) A core program of 28 single-term course equivalents, plus the spring field camp, is required of all students pursuing the B.Sc. in Forestry. Most courses normally taken during the first two years are part of this core program. Considerable program diversity exists in the third and fourth years.



Human Rel. one of R SOC 355, SOC 403, PSYCO 260, PSYCO 420, ORG T 303, IND R 304

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Resource Mgt. one course from each of two categories below:
Wildlife Mgt. - AN SC 351, or equivalent
Range Mgt. - PL SC 356, or equivalent
Forest Hydrology - FOR 450, or equivalent
Forest Engineering - FOREN 310, FOREN 335, FOREN 345, or equivalent
Forest Recreation - FOR 360, or equivalent

Sequence Legend
Required
Preferred or Concurrent

Other subjects consist of courses selected in consultation with an advisor, and free electives.

(3) A spring field camp (FOR 301), lasting five weeks and occurring between the second and third years of the degree program, is required of all students. At this camp, technical training is provided in forest mensuration, protection and ecology; a range of management concepts is introduced; and an integrated forest land-use plan is prepared.

33.4.2 COURSES REQUIRED IN THE FORESTRY CORE PROGRAM

(1) First Year Requirements:
AGFOR 204
BIOL 298
CHEM 250 or 202
CMPUT 351
ECON 201/202
FOR 315
MATH 202 (or 203)
STAT 241

NOTE: These courses must be taken in first year. Students transferring from other programs or institutions will be required to complete all of the above courses in which they are deficient during their first year in attendance in the B.Sc. Forestry program at The University of Alberta. Courses not successfully completed must be repeated.

Students entering without the appropriate Grade 12 prerequisites for the above courses should consult with the Forestry Office regarding their first year requirements.

(2) Second, Third and Fourth Years

The following courses are required to complete the core requirements:

Botany 324 or Plant Science 400; English 215; Forest Economics 345; Forest Engineering 201; Forest Science 301/310/311/314/316/317/340/430/431; Interdisciplinary Studies 432; Industrial Relations 304 or Organizational Theory 303 or Rural Sociology 355 or Sociology 403 or Psychology 260 or 420; Soil Science 310; Forest Science 380 or Plant Science 385; and one course from each of two of the following five groups — Forest Engineering (one of Forest Engineering 310/335/345 or equivalent), Forest Hydrology (Forest Science 450 or equivalent), Grazing Management (Plant Science 356 or equivalent), Wildland Recreation (Forest Science 360 or equivalent), Wildlife Managment (Animal Science 351 or equivalent). For sequencing of these courses please refer to the flow chart.

Transfer students should consult with the Department of Forest Science concerning course selection.

33.4.3 COURSES REQUIRED IN THE OPTIONAL PROGRAMS

Nine options or sub-programs are available to students in the B.Sc. Forestry program. A student may elect one of these options at the beginning of the third year. An option will use from 5 to 7 of the 12 remaining single-term course equivalents required for the degree. The remaining 5 to 7 single-term course equivalents are free electives and may be in any subjects chosen by the student. This allows the students to obtain either a broader or more specialized program according to their desires.

The Forest Economics Option emphasizes the economic aspects of forest resources, production, marketing, finance, and policy. Students who elect the forest economics option are encouraged to take Rural Sociology 355 in the core program. In addition they are required to take Forest Economics 445, two economic theory courses, and two additional economics or economics related courses selected in consultation with the Department of Rural Economy Advisor.

The Forest Hydrology Option provides emphasis on soil and watershed management. Students who elect the forest hydrology option are required to take Forest Science 450 and 452 and three other single-term course equivalents selected in consultation with the Department of Forest Science Advisor.

The Forest Management Option provides greater emphasis on the production aspects of forestry. Students who elect the forest management option are required to take Forest Science 411 and 412 and three other single-term course equivalents selected in consultation with the Department of Forest Science Advisor.

The Forest Operations Option provides emphasis in woods operations. Students who elect the forest operations option are required to take Forest Engineering 202, 203, 430, 440, and 450 and either Forest Engineering 310 and 320 or Forest Engineering 420 and 421. The program should be arranged in consultation with the Department of Agricultural Engineering Advisor.

The Forest Recreation Option places emphasis on the recreational use of wildland. Special attention is directed to the sociological aspects of outdoor recreation and at the impacts which such uses have on the recreational habitat. Those who select the forest recreation option are required to take Forest Science 360 and 462 and three other single-term course equivalents select in consultation with the Department of Forest Science Advisor.

The Forest Soils Option offers a forest land-use orientation, and at the same time forms a sound base for soil management aimed at high fibre production. For this option, students must take Chemistry 350 or 250 and Chemistry 202, Geology 202, Microbiology 315, Soils 420 and two other approved Soils courses selected in consultation with the Department of Soil Science Advisor.

The General Forestry Option allows the student to emphasize a subject or subjects related to any particular facet of forestry; e.g., an emphasis in forest protection could be obtained by taking specific courses in entomology, plant pathology, and other related subjects. Five single-term course equivalents are required for this option. Students who wish to emphasize topic areas related to Forestry not covered by an existing option should consult with the Department of Forest Science Advisor about course selection.

The Grazing Management Option provides an emphasis in wildlife and range management. Students are required to take Plant Science 356, 406, 471 and Animal Science 351, 460 and an approved single-term course in animal biology. This course will be selected in consultation with the Grazing Managment Program Coordinator. In addition, a student desiring specialty in pasture management is required to take Plant Science 354 and 472. Students are encouraged to discuss their program with the Program Coordinator at an early date.

The Wood Utilization Option emphasizes the use and manufacture of forest products including sawmills, plywood plants, and pulp and paper. Aspects of pollution control and abatement are considered. Students who elect the wood utilization option are required to take Forest Engineering 202, 203, 310, 320, 460, 470, and 480. Forest Engineering 420 and 421 are recommended. The program should be arranged in consultation with the Department of Agricultural Engineering Advisor.

33.4.4 MODIFIED FIRST YEAR AT THE UNIVERSITY OF CALGARY, THE UNIVERSITY OF LETHBRIDGE, AND ELSEWHERE

A modified first year may be taken by students at The University of Calgary, the University of Lethbridge, affiliated Alberta junior colleges, and other colleges or universities outside the province of Alberta. The second, third, and fourth years of this program are offered only at The University of Alberta. Details of this modified first year program are available in the calendars of these institutions.

Students who present other first year programs for transfer to The University of Alberta may be admitted into the Forestry program but they should note that they may not receive credit for all their courses. Acceptance of transfer students cannot be guaranteed on the basis of any minimum academic achievement level.

33.5 Pre-Veterinary Medicine Program

33.5.1 GENERAL INFORMATION

The Western College of Veterinary Medicine is located at The University of Saskatchewan, Saskatoon. Its program consists of two years of pre-Veterinary Medicine and four years of Veterinary Medicine. Alberta residents desiring to take Veterinary Medicine at The University of Saskatchewan may take two pre-Veterinary years at The University of Alberta. There is a quota on Alberta students entering Veterinary Medicine at The University of Saskatchewan and students with the highest standing in the work of the two pre-Veterinary years will receive preference.

Facilities at the Ontario Veterinary College are limited, and because of the great interest in veterinary medicine, few students from Alberta are likely to be admitted to that institution, with or without advanced standing. In fact all students considering Veterinary Medicine should know that there is such keen competition for admission to schools of Veterinary Medicine that a superior academic record is likely to be a requirement to win one of the limited number of places available anywhere.

Students planning to enter pre-Veterinary Medicine should note the entrance requirements described in § 13.3.3 of the University Regulations and Information for Students Calendar. Inquiries about the program should be addressed to the Dean, Faculty of Agriculture and Forestry, The University of Alberta.

33.5.2 PROGRAM OF COURSES

Two full years of university training are required for admission to the Western College of Veterinary Medicine, during which credit must be secured for the number of courses customarily considered a standard load in the curriculum in which they are obtained. The program of study must include:

(1) English (one full-session course or equivalent)

(2) Physics (one full-session course or equivalent)

(3) Biology or Zoology (one and one half full-session courses, including Genetics)

(4) Chemistry (two full-session courses, including Organic Chemistry)

(5) Mathematics (one full-session course or equivalent)

(6) Electives (sufficient to complete two full years)

In the Faculty of Agriculture and Forestry this is interpreted as follows:

(1) First Year Requirements:
AGFOR 201 / 204
One of BIOL 296 / 297 / 298 / 299 (BIOL 299 preferred)
CHEM 250 (or 202)
ECON 201 / 202
ENGL 215
MATH 202 (or 203)
MATH 204 or STAT 241

NOTE: These courses must be taken in first year. Students transferring from other programs or institutions will be required to complete all of the above courses in which they are deficient during their first year in attendance in the Pre-Veterinary Medicine program at The University of Alberta. Courses not successfully completed must be repeated.

NOTE: Students entering without the appropriate Grade 12 prerequisites for the above courses should consult with the Dean's Office regarding their first year requirements.

(2) Second Year Requirements:
CHEM 302 (or 350)
GENET 351 (or BIOL 297)
PHYS 203 (or 205) and PHYS 207 (or 209)

Electives to complete ten single-term courses ensuring at least one full session course equivalent in Biology or Zoology.

All courses must be beyond the senior matriculation level, and those in the natural sciences other than mathematics must include a laboratory. The student may select the remaining courses taken to complete the pre-veterinary sequence, but these courses should be consistent with the college program in which he / she is enrolled.

33.5.3 TRANSFER TO PROGRAM IN AGRICULTURE

Students successfully completing the two years of pre-Veterinary Medicine may apply to transfer to the program in Agriculture and may earn the B.Sc. in Agriculture in most specializations by completing two additional years of work with satisfactory standing. They are required to include all of the requirements of the B.Sc. Agriculture program that they may have missed as well as meeting the requirements of third and fourth years.

33.6 Graduate Studies

Programs leading to advanced degrees (M.Ag., M.Sc. and Ph.D.) are offered by most departments of the Faculty. Course programs and thesis projects are arranged in consultation with faculty members.

Thesis projects are normally carried out at The University of Alberta. In certain instances, some graduate students may arrange to undertake a portion of their research at one of the Agriculture Canada Research Stations.

General information on graduate studies at The University of Alberta with respect to admission, fees, and so forth, is given in the Faculty of Graduate Studies and Research Calendar. Specific information on the requirements and opportunities in a particular field of study may be obtained from the appropriate department of the Faculty of Agriculture and Forestry.

34 DETAILS OF COURSES

34.1 General Information

Courses required by the various programs in the Faculty of Agriculture and Forestry are listed here in alphabetical order, whether they are offered by the Faculty or by another faculty. Students are encouraged to examine calendars from other Faculties when selecting optional courses.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their course registration forms.

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 and up are normally restricted to senior and graduate students.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full-session course is weighted 6. A single-term course is normally weighted 3. Some courses involving research may vary in weight according to the length and difficulty of the research project. Some courses are offered for credit only, and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction. Normally, in the Faculty of Agriculture and Forestry, courses will be credited to the discipline listed in the square brackets.

The department responsible for registration may be found in square brackets at the end of a course description.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

34.2 Accounting

ACCTG 202. *Introductory Accounting.* ★3 (either term, 3-1.5s-0). Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors and other external decision-makers. Prerequisites: ECON 201/202.

ACCTG 204. *Managerial Information and Control Systems.* ★3 (either term, 3-0-2). Corporate goals, planning and control concepts, cost accumulation for pricing purposes, and product costing. Prerequisite: ACCTG 202.

ACCTG 307. *Financial Accounting.* ★3 (either term, 3-0-1.5). Accounting and reporting to persons outside of the organization. Note: Not open to students registered in the Faculty of Business Administration and Commerce.

34.3 Agricultural Economics

Department of Rural Economy

AG EC 203. *Introduction to Agricultural Economics.* ★3 (First Term, 3-0-0). Economic and social issues in food production and consumption; prices, costs, and incomes; nature and causes of farm problems; role of agriculture in the overall economy; world food situation; public policies affecting agriculture. Note: Not recommended for students with credit in any other agricultural economics course.

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). (See § 34.23.)

AG EC 315. *Data Analysis.* ★3 (First Term, 3-0-2). Sources and methods of collecting data relating to the rural economy. Appraisal and use of economic indicators important to agriculture. Analysis of time series data and introduction to experimental design and hypothesis testing as applied to agriculture. Preparation and presentation of economic reports. Prerequisite: STAT 241 recommended.

AG EC 316. *Quantitative Methods.* ★3 (Second Term, 3-0-2). Introduction to linear programming analysis, input-output analysis, and related techniques. Emphasis is placed on the use of these techniques for performing economic analysis in agriculture and forestry. Prerequisite: Mathematics 30 or equivalent. Note: Not open to students with credit in MATH 221, 243, or 281.

AG EC 323. *Management for Agricultural and Forest Business.* ★3 (First Term, 3-0-0). Principles of management applied to farm and forest supply, service, and distribution businesses. Prerequisites: AG EC 203 or ECON 201/202 or equivalent.

AG EC 333. *Introduction to Farm and Ranch Management.* ★3 (either term, 3-0-2). Application of economic principles to the organization and operation of a farm business. Introduction to farm records and business analysis; the management process and decision criteria for choice of enterprises, size of business, resource utilization, and timing of production; alternative methods of obtaining farming resources by purchase, leasing and credit. Prerequisite: AG EC 203 or ECON 201 or equivalent.

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). (See § 34.23.)

AG EC 373. *Agricultural Policy.* ★3 (First Term, 3-0-0). Economic policy aspects of the production, marketing, and income problems of farmers. Beliefs, values, institutions and participants in agriculture and their interaction in the development of economic policies for the industry. Prerequisites: AG EC 203 or ECON 201/202 or equivalent.

AG EC 381. *Retail Marketing of Agricultural Products.* ★3 (Second Term, 3-0-0). Wholesale and retail food market structures and conduct, with emphasis on consumer motivation, retail pricing strategies, and operational techniques and problems. Note: Not recommended for those specializing in agricultural economics. Prerequisites: AG EC 203 or ECON 201/202 or equivalent.

INT D 382. *Theory and Practice of Cooperation.* ★3 (First Term, 3-0-0). (See § 34.23.)

AG EC 384. *Marketing of Agricultural and Forest Products.* ★3 (either term, 3-0-0). Principles of marketing. Functions and institutions of markets. Market systems, price behavior, and futures markets for agricultural and forest products. Prerequisites: AG EC 203 or ECON 201/202 or equivalent.

AG EC 400. *Special Topics.* Maximum ★3 (either term, 3-0-0). Study of a selected topic or problem requiring both written and oral reports. Prerequisite: Consent of the Department Chairman.

AG EC 416. *Statistical Analysis.* ★3 (First Term, 3-0-2). Analysis of economic data relating to agricultural production, processing and marketing; collection of data, sampling methods, tests

of hypotheses, analysis of variance, regression, and correlation; time series analysis; presentation of data. Prerequisite: AG EC 315 or equivalent.

AG EC 423. *Management Techniques in Agriculture and Forestry.* ★3 (Second Term, 3-0-0). Application of decision-making techniques to the management of agricultural and forest businesses; computer assisted management game and selected case studies. Prerequisite: AG EC 323.

AG EC 433. *Advanced Farm and Ranch Management.* ★3 (Second Term, 3-0-0). Application of concepts and tools of farm business management in farm planning and farm management extension. Manual and computerized methods of farm accounting, business analysis and planning; interpretation and use of information for decision making in organizing and operating a farm business to achieve goals; planning under risk and uncertainty; farm business arrangements and strategies for growth. Prerequisite: AG EC 333 or equivalent.

AG EC 434. *Farm Finance and Appraisal.* ★3 (First Term, 3-0-0). Principles of financial management. Capital requirements and use of capital in agriculture; credit sources and credit management; appraisal principles and applications to finance, tax management and estate planning in farm business, laws and legislation affecting financial aspects of farm operations. Note: Formerly AG EC 343. Prerequisite: AG EC 333 or equivalent.

AG EC 435. *Agriculture and Forestry Law.* ★3 (either term, 3-0-3). Economic impact of laws and legislation on management of agriculture and forest resources, land tenure and user rights, farm wills and estates, legal implications of agriculture and forest transactions, farm credit legislation and creditor rights, public administrative law affecting farm and forest operations. Prerequisite: AG EC 333 or 384 or FOR EC 345 or INT D 365.

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0). (See § 34.23.)

AG EC 475. *Agricultural Development.* ★3 (Second Term, 3-0-0). Problems of agricultural development, the role of agriculture in area and national development, including examination of the potentials in resource use on farms and within the overall agricultural system. Note: Formerly AG EC 493. Prerequisite: AG EC 373 or equivalent; INT D 356 recommended.

AG EC 484. *Agricultural Marketing Economics.* ★3 (Second Term, 3-0-0). Structure and performance of agricultural markets. Applied agricultural market and price issues. Note: Formerly AG EC 463. Prerequisite: AG EC 384 or equivalent.

AG EC 485. *Agricultural Prices and Trade.* ★3 (Second Term, 3-0-0). Price determination, futures prices, and price behavior over time; exercises in statistical price analysis; theory of trade; trade and commodity agreements. Note: Formerly AG EC 385. Prerequisites: AG EC 203 or ECON 201/202 or equivalent; AG EC 384 recommended.

INT D 486. *Livestock and Meat Marketing.* ★3 (Second Term, 3-0-2). (See § 34.23.)

AG EC 500. *Research Projects in Agricultural Economics.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Investigations of special problems involving field or library study and preparation of written reports. Credit according to work done. Note: May be repeated for credit one time. Prerequisite: Consent of the Department Chairman.

AG EC 502. *Theoretical Applications to Agricultural Economics.* ★3 (First Term, 3-0-0). Elements of production, marketing, and welfare theories, and cost theory extensions, with applications to agricultural problems. Prerequisite: Consent of the Department Chairman.

AG EC 513. *Agricultural Econometrics.* ★3 (either term, 3-0-3). Introduction to research methodology, linear regression model, econometric theory, sampling theory and experimental design. Prerequisite: AG EC 416 or equivalent.

AG EC 514. *Quantitative Techniques.* ★3 (either term, 3-0-3). Applications of econometric extensions, operations research, mathematical programming and input-output analysis of problems in agricultural economics. Prerequisite: Consent of instructor; AG EC 316 and AG EN 420 recommended.

AG EC 515. *Research Methodology.* ★3 (First Term, 3-0-0). Problem identification and analysis, inductive procedures, formulating and testing hypotheses, causal analysis, rules of inference, role of theory, designing research projects. Note: Formerly AG EC 613. Prerequisite: Consent of instructor; AG EC 416 recommended.

AG EC 533. *Production Economics.* ★3 (Second Term, 3-0-3). Static and dynamic firm theory, production principles applied to resource use, resource and product combination, cost structure, uncertainty and expectations. Prerequisite: Consent of instructor; AG EC 502 and 416 recommended.

AG EC 565. *Natural Resource Economics.* ★3 (either term, 3-0-0). Availability, utilization, and quality of natural resources; criteria for resource development and conservation; public policy problems and analysis. Note: Formerly AG EC 553. Prerequisite: Consent of instructor; AG EC 502 and 416 recommended.

AG EC 573. *Agricultural Economics Policy.* ★3 (First Term, 3-0-0). Goals and instruments of agricultural policy, model constructions with decision and control criteria; national, regional, and provincial agricultural application. Prerequisite: Consent of instructor; AG EC 502 and 416 recommended.

AG EC 575. *Agriculture in Developing Countries.* ★3 (either term, 3-0-0). The role of agriculture in the economic growth of developing countries; influence of international trade and commodity agreements on economic development. Note: Formerly AG EC 593. Prerequisite: Consent of instructor; AG EC 475 and 502 recommended.

AG EC 584. *Marketing Economics.* ★3 (Second Term, 3-0-0). Market competition, price and location theories; market structure analysis; and market performance criteria. Note: Formerly AG EC 563. Prerequisite: Consent of instructor; AG EC 502 and 416 recommended.

AG EC 585. *Agricultural Trade and Price Analysis.* ★3 (either term, 3-0-0). Concepts underlying agricultural specialization and trade; spatial and behavioral price analyses; impact of trade controls and commodity agreements. Prerequisite: Consent of instructor; AG EC 485 recommended. Note: Formerly AG EC 583.

AG EC 601. *Agricultural Economics Seminar.* ★1 (Full Term, 0-1s-0). Reports by students, staff and visitors on studies of the literature, current research, and thesis projects. A field trip of approximately four days to study rural resources within Alberta will be arranged each spring, but it will not necessarily be required for all students. (All graduate students will be required to register for this course on a continuing basis while in residence at the University.)

AG EC 633. *Production Economics Research.* ★3 (Second Term, 3-0-0). Analysis of selected research problems; design of research projects in production economics. Prerequisite: AG EC 533 or equivalent.

AG EC 665. *Natural Resources Economics Research.* ★3 (Second Term, 3-0-0). Analysis of selected research problems and designing of research projects dealing with natural resources of importance to agriculture. Note: Formerly AG EC 653. Prerequisite: AG EC 565 or equivalent.

AG EC 684. *Marketing Economics Research.* ★3 (Second Term, 3-0-0). Analysis of selected research problems; design of research projects in marketing economics. Note: Formerly AG EC 663. Prerequisite: AG EC 584 or equivalent.

AG EC 900. *Non-Thesis Project.* ★variable (variable).

NOTE: For a list of Forest Economics courses offered see § 34.16.

NOTE: For a list of Interdisciplinary courses offered see § 34.23.

NOTE: For a list of Rural Sociology courses offered see § 34.34.

34.4 Agricultural Engineering

AG EN 202. *Engineering Principles Applied to Agriculture.* ★3 (either term, 3-0-3). Basic principles of statics and dynamics. Lab assignments deal with problems of analysis and elementary design of agricultural machines and structures. Not open to students with credit in FOREN 202.

AG EN 300. *Introduction to Farm Mechanization.* ★3 (either term, 3-0-0). Course emphasizes the relationship of all aspects of Agricultural Engineering in an overall systems planning environment. Topics include irrigation, structures, power, harvesting, machines and tillage.

AG EN 301. *Heating, Ventilating and Air Conditioning Agricultural Buildings.* ★3 (First Term, 3-0-3). Environmental requirements as determined by physiological principles. Environmental control.

AG EN 302. *Farm Structures.* ★3 (Second Term, 3-0-3). Structural design of agricultural buildings. Prerequisite: AG EN 202.

AG EN 303. *Agricultural Power Units.* ★3 (First Term, 3-0-3). Diesel, gasoline and L.P.G. engines; fuels and lubricants; power transmission; Nebraska Tests; and balancing the operating unit. Not open to students with credit in AG EN 305.

AG EN 304. *Agricultural Machinery.* ★3 (Second Term, 3-0-3). Characteristics of the functional elements of farm machines. Methods of evaluating machine performance.

AG EN 305. *Farm Power and Machinery.* ★3 (either term, 3-0-0). Introduction to farm power and machinery with emphasis on general characteristics of machines and processes. Note: Designed for students wishing general instruction in this area. Not open to students with credit in AG EN 303.

AG EN 308. *Agricultural Water Management.* ★3 (either term, 3-0-0). Elementary surveying and hydrology, erosion control, water supply development, irrigation and drainage, watershed and land-use planning. NOTE: Not open to students with credit in AG EN 313.

AG EN 313. *Soil and Water Engineering.* ★3 (First Term, 3-0-2). Basic principles of agricultural hydrology, soil-water relations, water resource development, water conservation practices. Prerequisite: SOILS 310 recommended. Note: Not open to students with credit in AG EN 308.

AG EN 402. *Agricultural Buildings.* ★3 (First Term, 1-0-4). Studies on special problems or topics related to buildings. Prerequisite: Consent of instructor.

AG EN 411. *Irrigation Principles and Practices.* ★3 (First Term, 3-0-0). Soil-water-plant relationships; water requirements; efficiency of water use; irrigation scheduling; planning and evaluation of irrigation systems. Prerequisite: SOILS 310 or equivalent. Offered jointly with Department of Soil Science.

AG EN 413. *Irrigation and Drainage Engineering.* ★3 (Second Term, 3-0-3). Irrigation and drainage principles; planning and design of irrigation and drainage systems. Prerequisite: CIV E 430.

AG EN 420. *Analysis of Agricultural Systems.* ★3 (First Term, 3-0-3). The application of mathematical programming methods to problems in agricultural systems. Prerequisite: MATH 243 or 312 or AG EC 316. Not open to students with credit in FOREN 420.

AG EN 421. *Simulation Methods in Agricultural Engineering.* ★3 (Second Term, 3-0-3). Use of analogue and digital computers to simulate agricultural processes (e.g., harvesting, fertilizing, seeding, ventilating, irrigating). Continuous and discrete simulation models are developed in group projects. Prerequisite: Introductory courses in Computing Science and Calculus. Not open to students with credit in FOREN 421.

AG EN 422. *Agricultural Machinery Project.* ★3 (First Term, 1-0-4). A research project in tillage or in grain or forage harvesting or in post-harvest technology, is assigned. The project is the application of mathematical techniques or an experiment. A final report is required. Prerequisite: Consent of instructor.

AG EN 453. *Power Units.* ★3 (First Term, 3-0-3). Energy conversion, power transmission, soil vehicle mechanics, hydraulic systems, tractor performance and evaluation, tractor dynamics. Prerequisites: CH E 324, CIV E 430, MEC E 350.

AG EN 454. *Agricultural Machinery.* ★3 (Second Term, 3-0-3). The course uses the wedge theory and the Mohr-Coulomb failure criteria as a basis for a simple tillage theory. Various tillage tools are examined as well as implement and tractor chassis mechanics. An introduction to harvesting processes is made. Particle dynamics and mechanics of raking and cutting are developed. Harvesting systems are noted. Prerequisite: MEC E 350, CIV E 480.

AG EN 456. *Post-Harvest Technology.* ★3 (First Term, 3-0-3). Forage conditioning, fractionation, wafering, preservation, and silage, grain and forage dehydration, feeding and transport equipment, storage regimes, cleaning, sorting and milling, conveying and metering, process control. Prerequisite: AG EN 301.

AG EN 500. *Agricultural Engineering Field Trip.* ★0. An extended trip to visit agricultural engineering operations is made every second year by third and fourth-year agricultural engineering students.

AG EN 503. *Instrumentation in Agricultural Engineering.* ★3 (First Term, 3-0-3). A study of the primary sensing elements used in agricultural engineering, their principles of operation and application. Prerequisite: CIV E 360, E E 302, MEC E 350.

AG EN 510. *Agricultural Engineering Project.* ★3 (Second Term, 1-0-4). Each final year student in the B.Sc. (Agr. Eng.) program works independently on a project approved by the Co-ordinator. The project must be either a literature review or an engineering design problem or an experimental research project or a combination of any of these. Both a brief outline and a formal report must be submitted by the due dates.

AG EN 552. *Advanced Irrigation and Drainage.* ★3 (Second Term, 3-1s-0). Studies of selected topics or special problems in irrigation and drainage. Prerequisite: SOILS 470 or AG EN 313.

AG EN 555. *Data Analysis and Processing.* ★3 (Second Term, 3-0-3). Application of statistical techniques to experiments in agricultural engineering including dimensional analysis and curve fitting techniques. Data computation with graphical output. Prerequisites: CMPUT 351, STAT 241.

AG EN 600. *Agricultural Engineering Seminar.* ★0 (0-1s-0).

AG EN 602. *Selected Topics in Agricultural Mechanization.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0). Application of statistical and mathematical techniques to selected problems in agricultural engineering.

AG EN 603. *Advanced Agricultural Buildings and Environment.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 604. *Advanced Farm Power and Machinery.* ★3 (Second Term, 3-0-0). Selected topics in traction, hydraulic systems, driver comfort and safety. New developments in farm machinery.

AG EN 605. *Project in Agricultural Machinery.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 606. *Advanced Soil and Water Engineering.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 910. *Non-Thesis Project.* ★3 (variable). Detailed report in the student's area of interest in an M.Ag. or M.Eng. program.

NOTE: For a list of Forest Engineering courses, see § 34.17.

34.5 Agriculture and Forestry

AGFOR 201. *Introduction to Agriculture.* ★3 (First Term, 3-0-0). The historical development of agriculture. Agriculture as a discipline, a vocation and a profession.

AGFOR 204. *Practice in Communication.* ★3 (either term, 3-0-0). Fundamentals of communication. Effectiveness of various methods of communicating. Practice in effective speaking, writing, group discussion and committee work. Application of audio visual techniques to extension material.

AGFOR 320. *Tropical Food Systems.* ★3 (Second Term, 3-0-0). Study of tropical food systems in developing countries—farm practices, storage, processing, transportation, marketing and home utilization. Importance of the effects of physical and social environment on such food systems. First year students not normaliy allowed.

AGFOR 404. *Field Trip.* ★0. Tour of Alberta agricultural enterprises arranged with the assistance of the Alberta Institute of Agrologists. Normally conducted in September prior to start of classes. Required of all agricultural students.

AGFOR 451. *Practical and Professional Agriculture.* ★0 (First Term, 1-0-0).

34.6 Animal Science

34.6.1 ANIMAL SCIENCE

AN SC 210. *Equine Physiology and Nutrition.* ★3 (First Term, 3-0-0). Application of the principles of digestive and metabolic physiology. Nutrient requirements of the horse; sources of energy and nutrients; feed formulation.

AN SC 300. *Principles of Animal Physiology.* ★3 (First Term, 3-0-0). Fundamental principles of initiation and regulation of animal function. Prerequisite: One university course in biology.

AN SC 311. *Applied Physiology of Domestic Animals.* ★3 (Second Term, 3-0-3). Physiological mechanisms of digestion, metabolism, growth, reproduction, and lactation in farm animals. Prerequisite: AN SC 300 recommended.

AN SC 351. *Wildlife Productivity and Management.* ★3 (Second Term, 3-0-3). Introduction to principles of animal functions related to production and management of wildlife. Analyses of relationships between productivity, habitat and land resource management. Field trips. Prerequisite: One university course in biology.

AN SC 372. *Animal Agriculture.* ★3 (First Term, 3-0-3). History and development of the dairy, beef, swine and sheep industries and potential of non-domestic species. Application of management principles to efficient production. Laboratory: Practical assignments in animal production. Note: Formerly AN SC 370.

AN SC 380. *Livestock Growth and Meat Production.* ★3 (First Term, 3-0-0). Concepts of growth and development applied to meat production from domestic livestock. Form and function of carcass tissues in the live animal. Heredity and meat production. Prerequisite: One University course in Biology recommended.

AN SC 460. *Fundamentals of Nutrition.* ★3 (First Term, 3-0-0). The nutrients, their character, sources, digestion and metabolism. Reading assignments in relevant literature.

AN SC 461. *Ruminant Nutrition.* ★3 (Second Term, 3-0-3). Application of energy metabolism, nutrient requirements, feed processing and feeding practices. Laboratory exercises in feed formulation. Prerequisite: AN SC 460.

AN SC 463. *Applied Monogastric Nutrition.* ★3 (Second Term, 3-0-3). Energy and nutrients in the nutrition of poultry, swine and other monogastrics. Nutrient requirements and feeding practices. Laboratory exercises in feed formulation. Prerequisite: AN SC 460.

AN SC 464. *Nutritional Experimentation.* ★3 (First Term, 2-0-3). Animal nutrition — laboratory procedures and metabolism trials.

AN SC 473. *Production and Management of Dairy Cattle, Sheep and Swine.* ★3 (Second Term, 3-0-0). Current practices, changes and progress in production and management methods. Note: Formerly AN SC 471.

AN SC 477. *Beef Cattle Production and Management.* ★3 (Second Term, 3-0-0). Current practices, changes and progress in beef cattle production. Note: Formerly AN SC 475.

AN SC 484. *Animal Population Genetics.* ★3 (First Term, 1-2s-0). Prerequisite: BIOL 297 or equivalent.

AN SC 485. *Animal Improvement.* ★3 (Second Term, 3-0-2). Prerequisite: AN SC 484.

AN SC 491. *Animal Biochemistry.* ★3 (Second Term, 3-0-3). Prerequisite: One single-term course in introductory biochemistry or equivalent.

AN SC 493. *Physiological Chemistry of Muscle and Meat.* ★3 (Second Term, 3-0-0). Structure, composition, development and metabolic role of muscle. Effects of hormones, nutrition, stress, slaughter and post-mortem metabolism. Prerequisite: One single-term course in introductory biochemistry or equivalent.

AN SC 501. *Research Project.* Weight according to work done to a maximum of ★6.

AN SC 510. *Ruminant Physiology.* ★3 (First Term, 3-0-3). Selected topics in metabolic endocrinology and environmental physiology of ruminants.

AN SC 550. *Grazing System Dynamics.* ★3 (First Term, 3-0-3). Application of the techniques of systems analysis and computer simulation in research and management of livestock and wildlife production systems.

AN SC 580. *Biometrical Techniques in Animal Science I.* ★3 (First Term, 3-0-3). Application of biometrical techniques to problems in animal science. Prerequisite: STAT 241 recommended.

AN SC 583. *Biometrical Techniques in Animal Science II.* ★3 (Second Term, 3-0-3). A continuation of AN SC 580 in the application of biometrical techniques to problems in Animal Science. Prerequisite: AN SC 580 recommended.

AN SC 587. *Biometrical Techniques in Quantitative Animal Genetics.* ★3 (Second Term, 3-0-3). Prerequisite: AN SC 580 recommended. Offered in alternate years. Note: Formerly AN SC 581.

AN SC 600. *Seminar.* ★3 (0-3s-0). Required each year of all graduate students.

AN SC 614. *Advanced Animal Nutrition.* ★3 (First Term, 3-0-0). A lecture and reading course in vitamins and minerals. Offered in alternate years.

AN SC 616. *Advanced Protein Nutrition.* ★3 (First Term, 3-0-0). A lecture and reading course in protein nutrition. Offered in alternate years.

AN SC 621. *Instrumentation for Animal Scientists.* ★3 (Second Term, 3-0-2). Operating principles, use, and care of, physiological, radionuclear, and other instruments used in Animal Science research. Emphasis on the suitability of instruments for research needs. Lab automation and data acquisition systems. Prerequisite: Consent of the Department.

AN SC 900. *Non-Thesis Project.* ★variable (variable).

NOTE: For a list of the Interdisciplinary courses offered see § 34.23.

34.6.2 POULTRY SCIENCE

POULT 352. *Principles and Practices of Poultry Production.* ★3 (Second Term, 3-0-3). Breeds and strains of poultry of economic importance; culling and selection; factors affecting percentage hatch; brooding, rearing and feeding of chickens and turkeys; feeding and management of layers and breeders; poultry housing; grading of eggs and poultry.

POULT 453. *Applied Poultry Genetics.* ★3 (Second Term, 3-0-3). Application of principles of genetics to breeding and improvement of poultry. Offered in alternate years.

POULT 459. *Processing Poultry and Poultry Products.* ★3 (First Term, 3-0-0). A study of the structure, chemical composition, nutritive value and preservation of eggs and egg products; factors affecting growth, carcass composition and quality of poultry meat; processing and marketing regulations.

POULT 462. *Poultry Diseases and Hygiene.* ★3 (First Term, 3-0-0). A study of the more important diseases of poultry — causes, symptoms, diagnosis, prevention and control.

34.6.3 VETERINARY SCIENCE

VETSC 300. *Introductory Veterinary Medicine.* ★3 (First Term, 3-0-0).

34.7 Biochemistry

BIOCH 300. *General Biochemistry.* ★6 (3-0-3). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and 250 or 350.

34.8 Biology

BIOL 130. *Introductory Biology.* ★6 (3-0-3). A basic biology course emphasizing the diversity and interrelations of organisms, the relationships between form and function, heredity, cellular structure, and ecological principles. Note: Not open to students with credit in Biology 30.

BIOL 296. *Evolutionary Biology.* ★3 (either term, 3-0-3). The numbers and kinds of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: Biology 30.

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30. Note: Students cannot receive credit for both BIOL 297 and GENET 351. Those taking BIOL 297 should take GENET 375 for the equivalent of GENET 351.

BIOL 298. *Environmental Biology.* ★3 (either term, 3-0-3). The basic principles and concepts of ecology. Emphasis on structure and function of populations, communities, and ecosystems. Laboratory to include ecological experiments, demonstrations and discussions. Prerequisite: Biology 30.

BIOL 299. *Biological Function.* ★3 (either term, 3-0-3). Comparative physiology of animals and higher plants from the standpoint of nutrition, energetics, gas exchange, circulation, ionic and osmotic relations and control systems. Prerequisite: Biology 30.

34.9 Botany

BOT 322. *Plant Ecology.* ★3 (First Term, 3-0-3). Ecological principles and relationships in the terrestrial plant world. Major topics include plant community, vegetation, physical environment, autecology, genecology, ecosystem function, plant population, succession, classification and ordination of communities. Field work consists of two one-day trips to study boreal forest and aspen parkland, and three half-day trips for orientation, plant community analysis, and environmental measurement. Prerequisite: BIOL 298 or consent of the Department.

BOT 324. *Plant Physiology I.* ★3 (First Term, 3-0-3). A general course on water and energy relations, evapotranspiration, net assimilation, stresses, ascent of sap, permeability, translocation, mineral nutrition, integration and control of metabolism. Prerequisites: BIOL 299, CHEM 200 or 202, or consent of the Department. CHEM 250 or 350 recommended.

34.10 Chemistry

CHEM 202. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics with applications to inorganic chemistry. Designed for students who are taking or have taken a university level Mathematics course. Prerequisite: CHEM 100, or Chemistry 30, or equivalent. Corequisite or prerequisite: MATH 202 or 203 or equivalent.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (e.g., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: CHEM 100, or Chemistry 30 or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Exceptions to this may be made only if written consent from the Department is obtained.

CHEM 302. *General Chemistry.* ★6 (3-1s-3). Introductory general chemistry designed for those students with credit in university level introductory organic chemistry. The course covers bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics with applications of the above theory to selected examples drawn from organic (including some biologically important systems) and inorganic chemistry. Prerequisite: Chemistry 30 or CHEM 100 and CHEM 250. Recommended pre or corequisite: MATH 202 or 203, and 204 (are strongly recommended for those planning to take further courses in chemistry). Note: Students with credit in CHEM 250 will proceed to CHEM 302. Credit in CHEM 302 will not be granted to students with credit in CHEM 200, CHEM 202 or equivalent.

CHEM 312. *Quantitative Analysis.* ★6 (3-0-6). Principles, methods, and experimental applications emphasizing titrimetry, separations, spectrophotometry and evaluation of experimental data. Includes examples of organic analysis, radiochemistry, atomic absorption spectroscopy, gas chromatography, and use of analytical literature. Prerequisite: CHEM 200 or 202 or 302.

CHEM 350. *Organic Chemistry.* ★6 (3-0-3). The study of molecular structure and reactivity of organic compounds of both biological and industrial interest. Special attention is given to the chemistry of polymers, fats, peptides and carbohydrates. Methods of structure determination are discussed. Prerequisite: CHEM 200 or 202 or 302. Note: Students who have otained credit for CHEM 250 cannot take CHEM 350 for credit.

34.11 Computing Science

Note on credit for introductory Computing Science courses: credit will be given for only one of 214, 261, 300, 351, and 357, and for only one of 215 and 352.

CMPUT 351. *Elements of Programming I.* ★3 (either term, 3-0-3). Basic programming techniques using a high level language; representation and manipulation of numeric and non-numeric data; survey of computing systems, history and applications. See above note re introductory Computing Science courses.

34.12 Economics

ECON 201. *Introduction to Micro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy: the distribution of income, inequality and poverty; the use of the environment; government economic policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies; international trade theory, problems and government policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 381. *Micro-Economic Analysis I.* ★3 (either term, 3-0-0). The theory of consumer behavior; theory of production and cost; price and output determination under competition, monopoly and other market structures. Prerequisite: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 323.

ECON 382. *Macro-Economic Analysis I.* ★3 (either term, 3-0-0). National income concepts and income determination; theories of aggregate consumption, investment and employment behavior; monetary and fiscal policy. Prerequisite: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 333.

34.13 English

ENGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0). A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265.

34.14 Entomology

ENT 207. *Agricultural Entomology.* ★3 (either term, 3-0-3). Introduction to insects and related anthropods emphasizing those aspects of their structure and life history responsible for some of them becoming pests and indicating those aspects towards which control measures can be directed. Principles of integrated control. Prerequisite: Biology 30 or BIOL 130 or equivalent recommended.

ENT 209. *Entomology for Non-biologists.* ★3 (either term, 3-0-3). Comparisons of the structure, relationships, behavior and place in nature of insects and man. No prerequisite.

ENT 302. *Survey of Entomology.* ★3 (First Term, 3-0-3). An examination of the world of insects from the points of view of major areas of entomological study including life histories, behaviour, taxonomy and phylogeny, physiology, development, morphology and ecology. Emphasis is given to the study of insects as animals not to the study of insects as pests. Prerequisite: Biology 30 or BIOL 130; ZOOL 353 or ENT 207 recommended.

ENT 317. *Comparative Morphology.* ★4 (First Term, 3-0-6). Comparative morphology of the major orders of insects and the evolution of some of their structures. Prerequisites: ZOOL 352 and 353.

ENT 392. *Medical and Veterinary Entomology.* ★3 (either term, 3-0-3). An introduction to the arthropods and an account of their influences on the health of man and other animals. Prerequisite: Biology 30 or BIOL 130 or equivalent. Not open to students with credit in ENT 492.

ENT 401. *Project in Basic Entomology.* Weight according to work done to a maximum of ★6. Individual study. Course object: to provide students with the opportunity to investigate through guided reading and discussion with a faculty member of their choice, the literature on one or more topics in basic entomology. According to circumstances and inclinations, limited experimental work might be undertaken.

ENT 407. *Principles of Insect Pest Management.* ★3 (Second Term, 3-1s-0). The ecological, economic and tactical concepts involved in insect pest management. Prerequisite: any entomology course or ZOOL 353 or FOR 380.

ENT 419. *Insect Development.* ★3 (Second Term, 3-0-3). Reproduction, embryonic and postembryonic development in insects. Prerequisite: Consent of instructor; ENT 317 recommended.

ENT 427. *Insect Taxonomy.* ★4 (First Term, 2-0-6). The higher taxa of insects and their relationships. Practice in identification. Prerequisite: Consent of instructor; ENT 317 and 419 recommended.

ENT 450. *Insect Biochemistry.* ★3 (First Term, 3-0-3). Comparative biochemistry of insects emphasizing processes which are characteristic of insects. Prerequisite: BIOCH 300 or 372, or PL SC 431 and 432; ENT 302 recommended.

ENT 471. *Project in Applied Entomology.* Weight according to work done to a maximum of ★6. A survey of the literature on one or more topics in applied entomology with or without an experimental study of related simple problems.

ENT 476. *Insect Toxicology.* ★3 (Second Term, 3-1s-2). Survey of present and prospective chemical insect control agents. Chemistry, mode of action, metabolism, environmental impact and hazards to man of insecticides, repellants, microbial agents, chemosterilants, insect growth regulators and chemicals which influence insect behaviour. Prerequisites: CHEM 250 and one of ENT 207, 302, 392, 480, 492 or FOR 380.

ENT 480. *Forest Entomology.* ★3 (either term, 3-1s-2). Characteristics of major North American forest insects. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. This course is intended for honors and graduate students in Entomology or any other biological science. A term paper is required. Given concurrently with FOR 380. Prerequisite: Biology 30 or BIOL 130 or equivalent. Not open to students with credit in FOR 380.

ENT 492. *Medical and Veterinary Entomology.* ★3 (either term, 3-1s-3). This course is Entomology 392 plus readings and discussion of topics of current interest. Prerequisite: Consent of instructor. Not open to students with credit in ENT 392.

ENT 527. *Insect Taxonomy.* ★3 (Second Term, 3-0-3). Literature of insect taxonomy. Principles and procedures. Speciation, phylogeny and zoogeography. Preparation of taxonomic papers. Prerequisite: Consent of instructor; ENT 427 recommended.

ENT 556. *Insect Physiology.* ★4 (Second Term, 2-0-5). Life processes illustrated by insects with emphasis on those peculiar to them and their relatives. Prerequisite: Consent of instructor; a senior physiology course recommended.

ENT 560. *Insect Ecology.* ★4 (First Term, 2-0-6). Relationships of insects to their environment. Community interactions. Laboratory will consist of field trips. Prerequisite: ENT 207 or 302 recommended.

ENT 561. *Advanced Insect Ecology.* ★4 (Second Term, 2-0-6). Behavioral aspects of insect ecology. Responses of insects to the biological and physical environment. Circadian activity rhythms. Prerequisite: ENT 560 recommended.

ENT 601. *Seminar.* ★2 (First Term, 0-2s-0). Required of all graduate students in each year.

ENT 602. *Seminar.* ★2 (Second Term, 0-2s-0). Required of all graduate students in each year.

ENT 610. *Project in Insect Morphology and Histology.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of instructor.

ENT 621. *Project in Insect Taxonomy.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of instructor.

ENT 650. *Project in Insect Physiology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 556 or 450.

ENT 660. *Project in Insect Ecology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 560 or 561 recommended.

ENT 670. *Project in Insect Toxicology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 476.

ENT 680. *Project in Forest Entomology.* Weight according to work done to a maximum of ★6. Prerequisite: FOR 380 or ENT 480 recommended.

ENT 692. *Project in Medical Entomology.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of instructor.

34.15 Food Science

34.15.1 FOOD SCIENCE

FD SC 200. *Introduction to Food Science.* ★3 (either term, 3-0-0). Historical and philosophical aspects of food supplies and food processing. World food supply and utilization. Trends in the processing, preservation, handling and utilization of food. Food fads and fallacies. No prerequisite.

FD SC 400. *Undergraduate Research Project.* Weight according to work done to a maximum of ★6. Critical reviews of selected literature, or laboratory project. Note: For third and fourth year students only. Students must obtain approval from Department before registration.

FD SC 402. *Quality Control.* ★3 (Second Term, 3-0-3). Acceptance sampling and testing, objective and subjective measurements, classification of quality attributes in food systems. Prerequisite: STAT 241 or equivalent.

FD SC 500. *Sensory Analysis of Foods.* ★2 (Second Term, 1-0-2). Physiology, psychology and biochemistry of taste and olfaction. Factors influencing sensory measurements. Qualitative and quantitative evaluation.

FD SC 502. *Brewing and Enology.* ★3 (Second Term, 3-0-0). Biological, biochemical, chemical and technical aspects of malting, brewing, winemaking and allied industries. Prerequisites: BIOCH 300 and MICRB 315 or equivalent.

FD SC 503. *Milk and Dairy Products.* ★3 (Second Term, 3-0-3). Biological, biochemical, chemical and technological aspects of fluid milk production and processing, and the manufacture of dairy products. Prerequisites: MICRB 201 or 315 and BIOCH 300 or equivalent.

FD SC 504. *Meat and Meat Products.* ★3 (First Term, 3-0-3). Biological, biochemical, chemical and technological aspects of the processing of meat and meat products. Prerequisites: MICRB 201 or 315 and BIOCH 300 or equivalent.

FD SC 505. *Fruit and Vegetable Products.* ★3 (First Term, 3-0-3). Biological, biochemical, chemical and technological aspects of the processing of fruits and vegetables. Prerequisite: BIOCH 300 or PL SC 431 and 432.

FD SC 506. *Cereal and Oil Seed Products.* ★3 (First Term, 3-0-3). Biological, biochemical, chemical and technological aspects of the processing of cereals and oil seeds. Prerequisite: BIOCH 300 or PL SC 431 and 432.

FD SC 530. *Food Product/Process Development.* ★6 (0-2s-4). An individual study project course normally restricted to fourth year students. Prerequisite: Consent of instructor.

FD SC 600. *Seminar.* ★1 (0-1s-0). Reports and discussion of research problems. Required during each year of all graduate students.

FD SC 601. *Topics in Food Science.* ★3 (either term, 0-3s-0). A lecture and discussion course on topics of current interest in Food Science.

FD SC 900. *Food Engineering Project.* Weight according to work done to a maximum of ★3. Problems in food engineering analysis and/or design. Note: Enrolment restricted to students registered in the M.Eng. (Food Process Engineering) program.

34.15.2 FOOD PROCESSING

FD SC 351. *Industrial Food Processing.* ★3 (First Term, 3-0-3). An introduction to the processing and preservation of foods. Prerequisite: Consent of instructor.

FD SC 453. *Unit Operations in Food Processing I.* ★3 (First Term, 3-0-3). Processes used in food manufacturing. Size reduction, mixing, emulsification, separation, extraction, distillation, sedimentation, centrifugation, crystallization and filtration. Prerequisite: FD SC 383 or equivalent.

FD SC 454. *Unit Operations in Food Processing II.* ★3 (Second Term, 3-0-3). Processes used in food preservation. Pasteurization, sterilization, evaporation, dehydration, refrigeration, chilling, freezing, and irradiation. Prerequisite: FD SC 383 or equivalent.

FD SC 552. *Food Protein Technology.* ★3 (Second Term, 2-0-4). Conventional and unconventional protein production. Protein sources, isolation and texturization processes. Functional properties of proteins in food systems. Prerequisite: Consent of instructor.

FD SC 554. *Food Processing Project.* ★3 (either term, 1-0-5). Laboratory and pilot plant studies of selected food preservation techniques. Evaluation of effects of processing on food characteristics. Prerequisite: Consent of instructor.

34.15.3 FOOD AND INDUSTRIAL MICROBIOLOGY

FD SC 461. *Food Microbiology I.* ★3 (First Term, 3-0-3). The principles of food microbiology and food poisoning. Prerequisite: MICRB 315 or equivalent.

FD SC 462. *Food Microbiology II.* ★3 (Second Term, 3-0-3). The microbiology of the food, dairy and allied industries. A continuation of FD SC 461. Prerequisite: FD SC 461 or equivalent.

FD SC 566. *Advanced Food Microbiology.* ★3 (Second Term, 1-0-4). Advanced techniques and recent developments in food microbiology. Prerequisite: FD SC 461.

FD SC 660. *Advanced Applied Microbiology.* ★3 (either term, 3-0-0). A lecture and discussion course on topics of current interest in applied microbiology with readings of original literature. Prerequisite: Consent of instructor.

34.15.4 FOOD CHEMISTRY

FD SC 471. *Food Chemistry I.* ★3 (First Term, 3-0-3). Chemistry and biochemistry of food constituents. Prerequisites: BIOCH 300 or PL SC 431 and 432.

FD SC 472. *Food Chemistry II.* ★3 (Second Term, 3-0-0). A continuation of FD SC 471. Prerequisite: FD SC 471.

FD SC 573. *Food Analysis.* ★3 (Second Term, 3-0-3). Classical and modern methods for the chemical analysis of foods and food ingredients. Prerequisite: Consent of instructor.

FD SC 671. *Advanced Food Chemistry.* ★3 (either term, 3-0-0). Selected topics in food chemistry. Note: A student may obtain credit in this course more than once. Prerequisite: Consent of instructor.

34.15.5 FOOD ENGINEERING

FD SC 383. *Introduction to Food Engineering.* ★3 (Second Term, 3-0-3). Dimension and units. Basic mathematical concepts and their use in food processes. Thermodynamics in food systems. Prerequisite: MATH 240 (or 242); PHYS 207 recommended.

FD SC 583. *Food Rheology.* ★2 (either term, 1-0-2). Flow and deformation of solid, semi-solid and liquid foods. Subjective and instrumental evaluation of food texture parameters. Prerequisite: Consent of instructor.

FD SC 586. *Food Process Evaluation.* ★3 (First Term, 3-3s-0). In depth study of optimization and cost analysis of selected food processes. Prerequisite: Consent of instructor.

FD SC 587. *Food Engineering Laboratory.* ★3 (either term, 1-0-3). Experiments in Food Engineering. Prerequisite: Consent of instructor.

FD SC 588. *Heat and Mass Transfer in Food Engineering.* ★3 (First Term, 3-0-0). Basic heat and mass transfer theories in solid and liquid foods. Application to selected unit operations. Prerequisite: Consent of instructor.

34.16 Forest Economics

Department of Rural Economy

FOREC 345. *Economics of Forestry.* ★3 (First Term, 3-0-0). Economic aspects of forest production, marketing, finance, and policy. Prerequisite: ECON 201/202 or equivalent. [Rural Economy]

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 432. *Forest Administration and Policy.* ★3 (either term, 3-0-0). (See § 34.23.)

FOREC 445. *Forest Production Economics.* ★3 (Second Term, 3-0-0). Production principles applied to the use of resources in forestry. Prerequisite: Consent of instructor; FOREC 345 recommended.

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0). (See § 34.23.)

FOREC 545. *Economics of Timber Utilization.* ★3 (Second Term, 3-0-0). Concerns introduction of wood processing industries into areas of predominantly old growth stock; optimum depletion rates and sustention of yield, development of infrastructure; siting mills; transportation and the pattern of development of wood processing industries; the role of the forest industries in regional development. Prerequisite: Consent of instructor; FOREC 445 recommended. [Rural Economy]

34.17 Forest Engineering

Department of Agricultural Engineering

FOREN 201. *Engineering Principles Applied to Forestry I.* ★3 (First Term, 2-0-4). Surveying, photogrammetry and photo interpretation for forestry and forest operation applications. (Offered jointly by the Departments of Agricultural Engineering and Forest Science). [Agricultural Engineering]

FOREN 202. *Engineering Principles Applied to Forestry II.* ★3 (First Term, 3-0-3). Basic principles of statics and dynamics. Lab and assignments deal with problems of analysis and elementary design of forest harvesting and transportation equipment and structures. Not open to students with credit in AG EN 202.

FOREN 203. *Engineering Principles Applied to Forestry III.* ★3 (Second Term, 3-0-3). Basic principles of graphics, surveying, soil mechanics and hydraulics as applied in forest harvesting operations. Prerequisite: FOREN 202.

FOREN 310. *Wood Technology I.* ★3 (First Term, 3-0-3). The anatomy and identification of North American woods; biological, chemical and physical properties of wood and its components; growth, natural and processing defects; lumber grading.

FOREN 320. *Wood Technology II.* ★3 (Second Term, 3-0-3). Mechanical properties of wood and its behavior under stress; wood moisture-strength relationships; anisotropic nature of wood; preservative treatments; uses of wood and wood products as engineering structural materials. Prerequisite: FOREN 310.

FOREN 335. *General Forest Harvesting and Transportation.* ★3 (First Term, 3-0-0). Harvesting and transportation methods and techniques as applied to industrial logging operations. This is a general course for forestry students requiring a basic knowledge of methods and equipment used in modern forest harvesting and transportation operations.

FOREN 345. *General Wood Utilization.* ★3 (Second Term, 3-0-0). Wood utilization including sawmills, plywood plants, chip and particle board and pulp and paper. A general survey course for forestry students requiring a basic knowledge of the utilization of forest products. Prerequisite: FOR 301 recommended.

FOREN 420. *Analysis of Forest Systems.* ★3 (First Term, 3-0-3). The application of mathematical programming methods to problems in forest systems. Prerequisite: MATH 243 or MATH 312 or AG EC 316. Not open to students with credit in AG EN 420.

FOREN 421. *Simulation Methods in Forest Engineering.* ★3 (Second Term, 3-0-3). Use of analogue and digital computers to simulate forest processes (e.g., harvesting, fire detection, fire suppression). Continuous and discrete simulation models are developed in group projects. Prerequisite: Introductory courses in Computing Science and Calculus. Not open to students with credit in AG EN 421.

FOREN 430. *Advanced Forest Harvesting Operations.* ★3 (First Term, 3-0-3). Advanced studies in forest harvesting practices and methods, covering processing and primary transport from the felling area to the roadside. Planning and cost analysis of types of logging operations and equipment. Prerequisite: FOREN 203.

FOREN 440. *Advanced Transportation of Forest Products.* ★3 (Second Term, 3-0-3). Advanced studies in the methods and systems of movement of wood and wood products. In depth consideration of specifications, cost components and equipment selection for forest roads, wood handling and hauling, including the economics of system design. Prerequisite: FOREN 203.

FOREN 450. *Logging Plan.* ★3 (Second Term, 3-0-0). The detailed preparation of a logging plan including selection and specification of harvesting method and equipment and all attendant wood handling, road specifications, design and costs. Prerequisite: FOREN 430 and 440.

FOREN 460. *Wood Utilization I.* ★3 (First Term, 3-0-3). The study in-depth of the use of forest products by sawmills, plywood plants, and in furniture manufacture. Production flow sheets, process analyses and cost relationships are examined with a view to improved productivity and utilization. Material utilization. Preservative treatment of wood. Product economics and current trends in the industry. Prerequisite: FOREN 310.

FOREN 470. *Wood Utilization II.* ★3 (Second Term, 3-0-3). The utilization of forest products by the pulp and paper industry. Particle and fibre boards will also be considered. System efficiency, cost relationships and the environmental effects of effluent and control are studied. Preservative treatment of wood. Prerequisite: FOREN 310.

FOREN 480. *Mill/Process Plan.* ★3 (either term, 1-0-4). The preparation of a mill or process layout including raw material appraisal and merchantable volume output. Consideration of equipment costs and operation. Prerequisite: Consent of instructor.

FOREN 550. *Problems in Forest Engineering.* ★3 (either term, 3-0-0). Directed study in forest engineering, including forest harvesting, road location and construction. Prerequisite: Consent of instructor.

FOREN 551. *Trends and Problems in Wood Science.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0). Directed study in wood technology and forest products with emphasis on current trends and new developments in wood science and the forest products industry. Prerequisite: Consent of the instructor.

FOREN 650. *Selected Topics in Forest Engineering.* ★3 (either term, 3-0-0).

34.18 Forest Science

FOR 200. *Introduction to Forestry.* ★3 (First Term, 3-0-0). A review of the field of forestry and integrated-use forest management including historical development of forestry and logging, wood products, silviculture and reforestation, forest enemies — fire, insects and diseases, forest land uses, conservation and management. Not available for credit to B.Sc. Forestry students.

FOR 301. *Forestry Field Camp.* ★6 (Second Term). Five weeks of field exercises in forest mensuration, protection, ecology, and management planning. Conducted immediately following normal second term examinations. Required of all students pursuing the B.Sc. in Forestry. Students enrolled in the B.Sc.F. program will not be allowed to enroll in FOR 430 without having satisfactorily completed FOR 301. A fee to cover room and board and partial camp expenses will be charged. For the 1979-80 camp, this would have been $250.00. Prerequisite: AG FOR 204, FOR 311, and FOR 315 or equivalent.

FOR 310. *Forest Measurements I.* ★3 (First Term, 3-0-3). Principles and practices of measuring and estimating present and future fiber production of forest communities; elementary photogrammetry; application of statistics and computer planning; field trips. Prerequisite: MATH 202 and STAT 241 or equivalent.

FOR 311. *Forest Measurements II.* ★3 (Second Term, 3-0-3). Designed to introduce students to the principles and practices of measuring a variety of wildland resources including land, timber, water, range, wildlife, and recreation. Prerequisite: FOR 310 and CMPUT 351 or equivalent.

FOR 314. *Forest Soils.* ★3 (Second Term, 3-0-3). Chemical, physical, and biological properties of soil in relation to site and the growth of forest vegetation; nutrient cycling; soil properties and management in relation to silvicultural and forest nursery practices. Prerequisite: SOILS 310 or equivalent. [Soil Science].

FOR 315. *Dendrology.* ★3 (First Term, 3-0-4). Identification, classification, distribution, and silvics of the forest trees and important shrubs of Canada; their commercial and ecological values; brief consideration of their management; field trips.

FOR 316. *Silviculture I.* ★3 (Second Term, 3-0-3). Forest succession and systems ecology; environmental factors and their relation to the establishment, growth, composition, and quality of forest trees and stands; **silvicultural systems;** field trips; seminars. Prerequisite: BIOL 298 and BOT 324 or equivalent.

FOR 317. *Silviculture II.* ★3 (First Term, 3-0-3). Harvest methods and silvicultural prescriptions for establishment of forest stands; stand growth manipulation and the development of stand structure to maximize the usefulness of forests; analytical methods of evaluating forest land capability; field trips. Prerequisite: FOR 316 or equivalent.

FOR 340. *Forest Fire Management.* ★3 (Second Term, 3-0-3). Fire behavior and its effects on wildland vegetation and environment; prevention, detection, and control; prescribed use in forest management; policy and objectives in fire management; field trips.

FOR 351. *Intermediate Forest Problems.* Weight according to work done to a maximum of ★3 (either term, variable). Individual problem work in specialized areas of forest science. Prerequisite: Consent of instructor.

FOR 354. *Problems in Integrated Forest Management.* ★3 (either term, variable). Directed study in the multiple aspects of forest management, including wildlife, recreation, watershed, range, and timber. Prerequisite: Consent of instructor.

FOR 360. *Recreational Use of Wildland.* ★3 (Second Term, 3-0-0). Recreational use of wildland resources; study of legislative programs, philosophical concepts, and organizations involved in wildland recreation management; field trips.

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). (See § 34.23.)

FOR 380. *Forest Entomology.* ★3 (either term, 3-0-3). Characteristics of major North American forest insects. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. Prerequisite: Biology 30 or equivalent. Not open to students with credit in ENT 480. [Entomology].

FOR 410. *Remote Sensing for Renewable Resource Inventory and Management.* ★3 (First Term, 3-0-3). Principles of remote sensing; techniques for data acquisition, storage, and interpretation; application to renewable resource inventory and management. Prerequisite: A previous course in at least one of the natural sciences. [Soil Science].

FOR 411. *Forest Management Inventory and Planning.* ★3 (First Term, 3-0-3). Study of advanced planning techniques — computer, photo, statistical, and mathematical — for collection, analysis, and storage of data for use by the forest resource manager in forest management; field trips. Prerequisite: CMPUT 351 and FOR 310 or equivalent.

FOR 412. *Forest Regulation.* ★3 (Second Term, 3-0-3). Study of forests and organizations with fiber production as a primary goal; organization structure; decision-making processes; financial evaluation; forest management; field trips. Prerequisite: FOR 430 or equivalent.

FOR 415. *Advanced Dendrology.* ★3 (Second Term, 3-0-0). Studies of woody plant vegetation of the world, especially temperate and boreal regions; evolution of, and genetic relationships among, tree and shrub genera and species; historical development of woody plant vegetation: optional field trip. Prerequisite: Consent of instructor. Offered alternate years.

FOR 417. *Tree Seed Handling.* ★3 (Second Term, 1½-0-3). Study of tree seed form cone crop prediction and seed collection through seed extraction, storage and testing to seeding in the field and nursery. Mostly literature review and seminar discussions, class size permitting, supplemented with laboratory studies of specific problem areas. Prerequisite: Consent of instructor. Offered alternate years.

FOR 422. *Forest Tree Improvement.* ★3 (Second Term, 3-0-3). Application of principles of inheritance as related to trees and in the management of forested lands; natural variation and ecological differentiation of woody plant populations; reproductive biology; methods of tree improvement. Prerequisite: Consent of instructor. Offered in alternate years.

FOR 427. *Tree Physiology.* ★3 (First Term, 3-0-3). Study of physiological processes of forest trees; relationship of environment and structure to function; emphasis on growth processes, primary production processes, reproduction, dormancy; influence of silvicultural practices on growth and physiological processes. Prerequisite: Consent of instructor.

FOR 430. *Forest Resources Management I.* ★3 (First Term, 3-0-3). Analytical techniques used by renewable resource

managers for management of wildland areas for single or multiple outputs; problems of defining optimality when confronted with competing uses and multiple outputs. Prerequisite: FOR 301, FOR 316, and FOR EC 345 or equivalent.

FOR 431. *Forest Resources Management II.* ★3 (Second Term, 3-0-3). The use of simulation, mathematical programming, and systems analysis by resource managers as decision-making aids. Application of techniques covered in Forest Resources Management I to case study problems. Prerequisite: FOR 317 and FOR 430 or equivalent.

INT D 432. *Forest Administration and Policy.* ★3 (either term, 2-1s-0). (See § 34.23.)

FOR 450. *Forest and Range Hydrology.* ★3 (Second Term, 3-0-3). The role of forest and range vegetation in determining the hydrologic function of a watershed; natural storage phenomena of the forest land surface and ways it can be modified; field trips. Prerequisite: FOR 314 or equivalent.

FOR 452. *Forest Watershed Management.* ★3 (First Term, 3-0-3). Principles and methods involved in managing forest and range land to obtain optimum production and regulation of water yields while maintaining soil stability; watershed management as a component of integrated forest resources management; field trips. Prerequisite: FOR 450 or equivalent.

FOR 462. *Wildland Recreation Management.* ★3 (First Term, 3-0-3). Principles and methods in managing wildlands for recreational use; relationships of outdoor recreation and other uses of wildlands in integrated forest resources management; field trips. Prerequisite: Consent of instructor.

FOR 463. *Wildland Recreation Planning.* ★3 (Second Term, 3-0-0). Survey of current principles and practices relevant to the planning of parks, wilderness areas and recreational environments in wildland settings. Emphasis on current case studies. Prerequisite: FOR 360 or FOR 462 or equivalent.

INT D 467. *Methods in Heritage Interpretation.* ★3 (Second Term, 3-0-0). (See § 34.23.)

INT D 470. *Heritage Interpretation Field Trip.* ★3. (Spring Session, Second Term, 0-2-6). (See § 34.23).

FOR 500. *Research Methods in Forestry.* ★3 (Second Term, 3-0-0). Use of the scientific method in forestry research, formulation of hypotheses, design of experiments, interpretation of data. Prerequisite: Consent of the instructor.

FOR 502. *Reading Projects in Forestry.* Weight according to work done to a maximum of ★6. Library study of a selected topic, regular meetings for discussion, and a written report. Prerequisite: Consent of the instructor.

FOR 503. *Advanced Problems in Forestry.* Weight according to work done to a maximum of ★6. Directed study in forestry. Prerequisite: Consent of instructor.

FOR 511. *Advanced Forest Measurements.* ★3 (Second Term, 3-0-3). Selected topics in forest and wildland mensuration, sampling methods, modelling of biological systems, and data management. Introduction to basic concepts of scientific research and design of experiments. Prerequisite: Consent of instructor.

FOR 517. *Advanced Silviculture.* ★3 (Second Term, 3-0-3). Various topics including forest tree nursery locations, cycles, stock, types, instrumentation requirements and problems; advanced aspects of silvicultural planning related to integrating silvicultural considerations into woods operations. Prerequisite: Consent of instructor.

FOR 520. *Problems in Silviculture.* ★3 (either term, variable). Directed study in silviculture. Prerequisite: Consent of instructor.

FOR 522. *Seminar in Tree Improvement.* ★3 (Second Term, 0-3s-0). Reports and discussion of current literature and advanced topics in forest genetics and tree improvement. Prerequisites: Graduate standing and consent of instructor; FOR 422 and GENET 351 recommended.

FOR 525. *Problems in Forest Ecology.* ★3 (either term, variable). Directed study in forest ecology. Prerequisite: Consent of instructor.

FOR 526. *Advanced Forest Ecology.* ★3 (Second Term, 3-0-0). Studies of the ecology of the major forested ecosystems of Canada, particularly composition, physical and biological factors of importance, variability within regions, silvicultural techniques, management problems; limiting factors, productivity, special adaptations, role of man; term project required. Optional field trip. Prerequisite: Consent of instructor. Offered alternate years.

FOR 535. *Problems in Forest Resources Management.* ★3 (either term, variable). Directed study in forest resources management. Prerequisite: Consent of instructor.

FOR 545. *Problems in Forest Fire.* ★3 (either term, variable). Directed study in forest fire. Prerequisite: Consent of instructor.

FOR 546. *Advanced Fire Ecology.* ★3 (First Term, 3-0-0). The role of fire as an abiotic input in wildland environments. Its affect on plant succession; primary producers, consumers, decomposers; from an autecological and synecological perspective. Prerequisite: Consent of instructor.

FOR 555. *Problems in Forest Hydrology.* ★3 (either term, variable). Directed study in forest hydrology. Prerequisite: Consent of instructor.

FOR 565. *Problems in Forest Recreation.* ★3 (either term, variable). Directed study in forest recreation. Prerequisite: Consent of instructor.

FOR 600. *Forestry Seminar.* ★3 (0-1.5s-0). Reports by students, staff and visitors on studies of the literature, current research, and thesis projects. Required each year of all graduate students. Attendance and participation at all seminars is expected. Prerequisite: Graduate standing.

FOR 699. *Forestry Problems.* Weight according to work done to a maximum of 6. Prerequisite: Graduate standing and consent of instructor.

NOTE: For a more complete list of Interdisciplinary courses offered, see § 34.23.

34.19 Genetics

GENET 351. *Principles of Genetics.* ★6 (3-0-3). Physical basis of heredity; transmission genetics in eukaryotes (plants and animals) and prokaryotes (bacteria and viruses); gene structure; gene mutations; human genetics; gene action at the molecular, biochemical and development levels; genetic coding, cytoplasmic inheritance; sex determination; polyploidy, aneuploidy and chromosomal aberrations. Prerequisite: Biology 30 or BIOL 130, or consent of the Department. Note: Students cannot receive credit for both BIOL 297 and GENET 351.

GENET 375. *Eukaryote Genetics and Cytogenetics.* ★3 (either term, 3-0-3). A comprehensive discussion of Mendelian and neo-Mendelian inheritance, chromosome behavior and their interrelationships. Prerequisite: BIOL 297.

34.20 Geology

GEOL 202. *Physical Geology.* ★3 (First Term, 3-0-3). Internal structure and composition of the earth; continents and oceans; minerals and rocks; groundwater and water supply; erosion, transportation and deposition of sediments; igneous activity and metamorphism; mountain building; plate tectonics. Not available to students with credit in GEOL 301 or 390.

34.21 Home Economics

FD NU 222. *Current Topics in Human Nutrition and Foods.* ★3 (First Term, 3-0-0). An introductory course. Selected problems in community nutrition in developed and developing countries. Prerequisite: Chemistry 30 or consent of the instructor. Note: Not open to students with credit in FD NU 325, 327, 464 or 465.

FD NU 464. *Nutrition.* ★3 (First Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on energy, carbohydrates, fats and proteins. Prerequisite: BIOCH 300.

FD NU 465. *Nutrition.* ★3 (Second Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on vitamins and minerals. Prerequisite: BIOCH 300.

34.22 Industrial Relations

IND R 304. *Industrial Relations in Canada.* ★3 (either term, 3-0-0). Union, management and government participation in the Canadian industrial relations system. It examines the nature, causes and possible methods of settling labor disputes and processing grievances. It gives the student a chance to participate in simulated negotiations of collective agreements.

34.23 Interdisciplinary Courses

Courses listed below are the concern of more than one discipline. Students may register in these courses either as options or as courses in subjects of concentration in one of the disciplines listed in the footnote under each course, subject to the usual curriculum requirements, prerequisites, etc. Normally, in the Faculty of Agriculture and Forestry, these courses will be credited to the discipline listed in square brackets. Instruction will be offered by members of one or more of the departments or faculties listed beneath the course description. *For the following Interdisciplinary course descriptions, where the department responsible for registration has been assigned the department so designated will appear in square brackets following the course description.*

INT D 230. *Practical Plant Biology.* ★3 (First Term, 3-0-3). The practical aspects of plant structure and classification. Laboratory exercises will emphasize crop plants. Prerequisite: Biology 30 or BIOL 130 (Offered jointly by the Departments of Botany and Plant Science). [Plant Science]

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture. Prerequisite: ECON 201/202 or equivalent. (Offered jointly by the Departments of Rural Economy and Economics.) [Rural Economy]

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). A survey of world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities. Prerequisite: ECON 201/202 or equivalent. (Offered jointly by the Departments of Rural Economy and Economics.) [Rural Economy]

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: R SOC 355 or SOC 202 or 403 or equivalent. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). Economics of natural resources related to agriculture and forestry; conservation, population, resource scarcity, property and tenure institutions, economic rent and resource pricing, resource development and evaluation, environmental protection, public resource policy. Prerequisite: ECON 201 or equivalent; ECON 202 recommended. Note: Not open to students with credit in ECON 365. (Offered jointly by the Departments of Rural Economy and Forest Science.) [Rural Economy]

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). Economic implications of outdoor recreation development and use with emphasis on location and time factors and consumer activities and expenditures. Benefit-cost evaluation of outdoor recreation resource use in the context of multiple land use, with public policy guidelines for privately and publicly owned recreation resources. Prerequisite: ECON 201 or equivalent; ECON 202 recommended. (Offered jointly by the Departments of Rural Economy, Economics, Forest Science and Recreation Administration.) [Rural Economy]

INT D 369. *Economics of the Environment.* ★3 (either term, 3-0-0). Economic growth and the deterioration of the environment; types and causes of environmental deterioration; theory, policy, and measurement relating to environmental deterioration; recreation economics; and current Canadian environmental topics. Prerequisite: ECON 201 or 304 or 307. (Offered jointly by the Departments of Economics and Rural Economy.) [Economics]

INT D 382. *Theory and Practice of Cooperation.* ★3 (First Term, 3-0-0). Economic and sociological principles of cooperation; the evaluation of cooperative organization; cooperative law and taxation; management and finance of cooperatives. [Rural Economy]

INT D 432. *Forest Administration and Policy.* ★3 (either term, 3-0-0). Analysis of the political, institutional and administrative factors which influence the development and implementation of forest and conservation policies in Canada, the United States, and other countries. Forest administration and organization; policy as a guideline for managerial decision making. Prerequisite: FOR 430 or equivalent. (Offered jointly by the Departments of Forest Science and Rural Economy.) [Forest Science]

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). Social problems in Canadian rural life; analysis of policy making processes related to these problems. Prerequisite: Consent of instructor; INT D 356 recommended. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

INT D 458. *Socio-economic Development of Western Canadian Agriculture.* ★3 (First Term, 3-0-0). The economic and social origins of western Canadian agricultural development. A chronological examination of farm and political organizations and other agrarian social movements influencing the farming sector. The growth of public policy and development of the institutional framework supporting agriculture. Discussion of past and present issues in western Canadian agricultural development, including such factors as land settlement, transportation and farming support services. Prerequisite: R SOC 355 or SOC 202 or 403 or equivalent. (Offered jointly by the Departments of Rural Economy and Sociology.) [Rural Economy]

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0). Economics of utilizing and conserving land, water and energy resources in Agriculture and Forestry. Prerequisite: Consent of instructor; INT D 365 recommended. [Rural Economy]

INT D 466. *Principles of Heritage Interpretation.* ★3 (First Term, 3-0-0). An examination of heritage interpretation as an expression of cultural/environmental recreational programs. Prerequisite: Consent of instructor. (Offered jointly by the Departments of Forest Science and Recreation Administration.) [Recreation Administration]

INT D 467. *Methods of Heritage Interpretation.* ★3 (Second Term, 3-0-0). Application of principles of interpretation of natural and historic resources. Focus on management techniques and development of interpretative programs. Case studies and field trip. Prerequisite: Consent of instructor; INT D 466 recommended. (Offered jointly by the Departments of Forest Science and Recreation Administration.) [Forest Science]

INT D 470. *Heritage Interpretation Field Trip.* ★3 (Spring Session, Second Term, 0-2-6). Extended field trip to examine comparatively the philosophies, approaches and applied methodologies of a diverse range of institutions and agencies engaged in the practice of heritage interpretation. Prerequisite: Consent of instructor. (Offered jointly by the Department of Forest Science and Recreation Administration). [Forest Science]

INT D 486. *Livestock and Meat Marketing.* ★3 (Second Term, 3-0-2). Marketing problems, potentials and principles studied through in-depth analysis of the red meat industry. Prerequisite: Consent of instructor. Note: Limited enrolment, preference given to fourth year agricultural students. (Offered jointly by the Departments of Rural Economy and Animal Science.) [Rural Economy]

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and methods of investigation in these fields. Offered alternate years. Prerequisite: Consent of instructor; BIOCH 300 and 372 or PL SC 431 and 432 or equivalent recommended. (Offered jointly by the Departments of Botany and Plant Science.) [Plant Science]

INT D 566. *Resource Economics II: Economics of the Environment.* ★3 (either term, 3-0-0). Economic theory and policy relating to resource and environmental quality problems; welfare and public policy issues in resource decision-making; the relationships between economic growth and environmental preservation externalities and public goods; economics of pollution; recreation economics; selected Canadian environmental issues. [Economics]

34.24 Legal Relations

LEG R 310. *Commerical Law.* ★3 (either term, 3-0-0). An introduction to the Canadian legal system with emphasis on legal problems in commerical law.

34.25 Mathematics

MATH 101. *Trigonometry.* ★0 (First Term, 2-0-0). This course consists of the Trigonometry material contained in MATH 100 and is offered in the Winter Session. Prerequisite: Mathematics 20 or equivalent. Note: This course cannot be taken for credit towards a degree.

MATH 202. *Elementary Calculus I.* ★3 (First Term, 3-0-1). Review of analytic geometry, differentiation and integration of simple functions, applications. Prerequisite: Mathematics 30 or equivalent. Note: Those students who have no knowledge of trigonometry are required to take MATH 101 concurrently. This course may not be taken for credit if credit has already been obtained in any of MATH 203, 207, 212, or 245.

MATH 203. *Elementary Calculus I.* ★3 (either term, 3-0-0). This course description is the same as for MATH 202. Prerequisite: Mathematics 30, Mathematics 31 (calculus sequence), or equivalent. Students with low grades in high school calculus should take MATH 202. Note: This course may not be taken for credit if credit has been obtained already in any of MATH 202, 207, 212, or 245.

MATH 204. *Elementary Calculus II.* ★3 (either term, 3-0-0). Differentiation and integration of trigonometric, exponential and logarithmic functions. Indeterminate forms and improper integrals. Techniques of integration. Applications. Prerequisite: MATH 202 or 203, or 245 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 208 or 213.

MATH 240. *Algebra and Elementary Calculus I.* ★3 (either term, 4-0-0). Differential and integral calculus of algebraic, exponential and logarithmic functions with applications to problems in business and economics. Prerequisite: Mathematics 30 or equivalent. Note: This course is intended primarily for students registered in the faculties of Business Administration and Commerce, Agriculture and Forestry, and Pharmacy and Pharmaceutical Sciences. This course may not be taken for credit if credit has already been received in any of MATH 202, 203, 207 or 212. Students who have taken Mathematics 31 should take MATH 242.

MATH 242. *Algebra and Elementary Calculus I.* ★3 (either term, 3-0-0). This course covers the same material as MATH 240. Prerequisites: Mathematics 30 and Mathematics 31 or equivalent.

MATH 243. *Linear Algebra.* ★3 (either term, 3-0-0). Vector and matrix notation, solving linear equations, vector spaces, matrix algebra, determinants, and applications to economics and commerce, including linear programming, marketing problems, and input-output analysis. Prerequisite: Mathematics 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of the following: MATH 274, 278, 312, 381. This course is required for all students in Business Administration and Commerce.

34.26 Microbiology

MICRB 201. *Elementary Microbiology.* ★3 (Second Term, 3-0-3). An introduction to the microbial world, with emphasis on the general characteristics of microorganisms as affecting their relationship with man and other organisms. Note: Offered to students in Agriculture and Forestry, and as a Natural Science option to students in Arts. Not available to students in Science.

MICRB 315. *General Microbiology I.* ★3 (either term, 3-0-3). The organization, morphology and cell structure of microorganisms with emphasis on bacteria and fungi. Microbial growth and its control, aspects of medical and applied microbiology and microbial ecology will be discussed. Laboratory exercises are designed to demonstrate basic microbiological techniques as well as relevant microbial activities and functions.

MICRB 365. *General Microbiology II.* ★3 (Second Term, 3-0-3). An introduction to the metabolic and physiological activities of microorganisms with emphasis on their interaction with other microorganisms, higher plants, animals and the environment. Discussion of the mode of action of antibiotics and other metabolic inhibitors and the basic properties of viruses, virus infection and replication. Laboratory exercises are designed to introduce students to current techniques and phenomena related to the lecture material. Prerequisites: MICRB 315, BIOL 297 or GENET 351. Corequisite: BIOCH 300 (or equivalent) or consent of the Department.

34.27 Organization Theory

ORG T 303. *Behavior in Organizations.* ★3 (either term, 3-0-0). Examines the sociological and psychological bases of individual behavior in organizations. Topics of individual psychology examined will include cognition, perception, attitude formation and change, personality structure and change, and motivation. The course will also investigate the behavior of individuals in groups and organizations. In this context various aspects of group dynamics such as leadership, communication, interpersonal sensitivity, morale and satisfaction, and the formation and attainment of individual and group goals will be discussed.

34.28 Physical Education

Faculty of Physical Education and Recreation

Where possible, sections will be made available in the following courses for students *not* in the Bachelor of Physical Education degree program; however, limited space is available. All advanced (300 level) courses are available only to those students who present credit in the corresponding introductory level activity courses or, in exceptional cases, with consent of the Department.

DANCE 270 (Introduction the Modern Dance) ★3 (either term, 3-0-0).

DANCE 275 (Dance Forms) ★3 (either term, 3-0-0).

DANCE 370 (Dance Perspectives) ★3 (either term, 3-0-0).

DANCE 371 (Modern Dance Techniques) ★3 (either term, 3-0-0).

DANCE 372 (Modern Dance Composition) ★3 (either term, 3-0-0).

DANCE 376 (International Folk Dance) ★3 (either term, 3-0-0).

DANCE 47D (Dance Practicum) ★3 (Both Terms, 2-0-0).

HE ED 391 (Health Education in Secondary Schools) ★3 (either term, 3-0-0).

P ED 211 (Introduction to Basketball) ★3 (either term, 3-0-0).

P ED 212 (Introduction to Field Hockey) ★3 (either term, 3-0-0).

P ED 213 (Introduction to Football) ★3 (First Term, 3-0-0).

P ED 214 (Introduction to Ice Hockey) ★3 (either term, 3-0-0).

P ED 215 (Introduction to Soccer) ★3 (First Term, 3-0-0).

P ED 216 (Introduction to Volleyball) ★3 (either term, 3-0-0).

P ED 224 (Introduction to Wrestling) ★3 (either term, 3-0-0).

P ED 227 (Introduction to Aquatics) ★3 (either term, 3-0-0).

P ED 231 (Court Sports) ★3 (either term, 3-0-0).

P ED 232 (Curling and Bowling) ★3 (Second Term, 3-0-0).

P ED 235 (Judo and Yoga) ★3 (either term, 3-0-0).

P ED 237 (Ice Skating) ★3 (First Term, 3-0-0).

P ED 305 (Officiating) ★ (First Term, 2-0-1).

P ED 311 (Basketball Coaching) ★3 (either term, 3-0-0).

P ED 313 (Football Coaching) ★3 (First Term, 3-0-0).
P ED 314 (Ice Hockey Coaching) ★3 (either term, 3-0-0).
P ED 315 (Soccer Coaching) ★3 (First Term, 3-0-0).
P ED 316 (Volleyball Coaching) ★3 (either term, 3-0-0).
P ED 324 (Wrestling Coaching) ★3 (Second Term, 3-0-0).
P ED 325 (Intermediate Gymnastics) ★3 (either term, 3-0-0).
P ED 327 (Advanced Aquatics) ★3 (either term, 3-0-0).
P ED 328 (Synchronized Swimming) ★3 (Second Term, 3-0-0).
P ED 329 (Track and Field Coaching) ★3 (either term, 3-0-0).
P ED 401 (Sociology of Sport) ★3 (either term, 3-0-0).
P ED 402 (History of Sport and Physical Education) ★3 (either term, 3-0-0).
P ED 405 (Comparative Physical Education) ★3 (either term, 3-0-0).
P ED 427 (Principles of Aquatic Instruction) ★3 (either term, 3-0-0).
P ED 428 (Competitive Swimming) ★3 (Second Term, 3-0-0).

34.29 Physics

PHYS 203. *Introductory General Physics I. (Mechanics).* ★4 (First Term, 4-1s-3). A non calculus course in physics for students *without* Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles, oscillations. Prerequisite: Mathematics 30. The course is intended to be taken in sequence with PHYS 207 and/or 209. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 205. *Introductory General Physics I (Mechanics).* ★3 (First Term, 3-0-3). Course contents same as PHYS 203 but designed for students who have taken Physics 30. Prerequisite: Physics 30; Mathematics 30. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 207. *Introductory General Physics II (Matter, Sound, Heat and Optics).* ★3 (Second Term, 3-0-3/2). Properties of gases, liquids and solids; wave motion and sound, heat and thermodynamics, geometrical and physical optics. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 207 and PHYS 212.

PHYS 209. *Introductory General Physics III (Electricity, Magnetism and Atoms).* ★3 (Second Term, 3-0-3/2). The nature of electricity and magnetism, AC currents, electromagnetic waves, atomic and nuclear structure. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 209 and PHYS 212.

PHYS 212. *Basic General Physics.* ★6 (3-0-3). Physics 212 utilizes some calculus. Topics include mechanical, thermal, electromagnetic and optical properties of matter; the forms and transformations of energy; introduction to the atomic theories of modern physics. Prerequisites: Physics 30; Mathematics 30. Corequisites: MATH 202, 204. Credit may be obtained for only one of PHYS 203, 205 or 212.

NOTE: § 34.30 Reserved.

34.31 Plant Science

34.31.1 PLANT SCIENCE

PL SC 215. *Introductory Plant Science.* ★3 (Second Term, 3-0-0). Climatic, soil and biological factors in relation to growth of native and crop plants. Their regional adaptability, distribution and production. Principles of crop protection and management. Formerly PL SC 300.

PL SC 600. *Plant Science Seminar.* ★1 (0-1s-0). Oral reports by individual students covering the literature on selected topics. Required of all graduate students.

34.31.2 BIOMETRICS

PL SC 500. *Statistics for Biological Research.* ★3 (First Term, 3-0-3).

34.31.3 CROP ECOLOGY AND PLANT BREEDING

PL SC 352. *Weeds and Weed Control.* ★3 (Second Term, 3-0-3). Crop-weed relationships, methods of control, herbicide properties and uses, weed identification. Other uses of plant growth regulators. Prerequisite: Biology 30 or BIOL 130.

PL SC 354. *Forage Crops.* ★3 (Second Term, 3-0-3). An introduction to the establishment, management, conservation and utilization of forages for pasture and hay. Morphological structure and varietal forms of the principal forage grasses and legumes.

PL SC 355. *Cereals and Industrial Field Crops.* ★3 (First Term, 3-0-3). A study of factors influencing the production, distribution, development, yield and quality of annual field crops.

PL SC 356. *Range Management.* ★3 (First Term, 3-0-3). Introduction to range management principles and practices: effects of grazing on plants; vegetation types; utilization and range health; range management planning.

PL SC 406. *Range Plants.* ★3 (Second Term, 3-0-3). Identification, ecology and nutritive value of plants grazed by wild and domestic ungulates on western Canadian rangelands. A plant collection is required. Prerequisite: One of PL SC 356, FOR 315, INT D 230, BOT 302 or equivalent.

PL SC 465. *Introduction to Plant Breeding.* ★3 (First Term, 3-0-0). Basic principles of crop improvement by plant breeding. Development of plant breeding methods and their relationship to the major crop species. Prerequisite: BIOL 297 or equivalent.

PL SC 470. *Physiology of Herbicidal Action.* ★3 (First Term, 3-0-0). Absorption, translocation, degradation, mechanism of action. Prerequisites: PL SC 352 and either PL SC 400 or BOT 320.

PL SC 471. *Topics in Range Management.* ★3 (First Term, 3-0-3). Discussion of topics from the literature in range management; weekend field trips. A plant collection is required. Prerequisites: PL SC 356 and PL SC 406, or equivalent.

PL SC 472. *Pasture Management.* ★3 (First Term, 3-0-3). Forage production and management practices as related to the growth and development of the plant. Pasture establishment. Floral induction and seed production. Forage crop quality and utilization. Prerequisite: PL SC 354.

PL SC 501. *Reading Project in Ecology and Crop Production.* Weight according to work done to a maximum of ★6.

PL SC 502. *Research Project in Ecology and Crop Production.* Weight according to work done to a maximum of ★6.

PL SC 503. *Topics in Plant Breeding.* ★3 (Second Term, 3-0-0). Theory and practice for special plant breeding problems. Genetic control of physiological processes and plant morphology and its relationship to yield, effect of breeding systems on plant breeding methodology, control plots, crop quality. Prerequisite: PL SC 465.

PL SC 504. *Reading Projects in Plant Breeding.* Weight according to work done to a maximum of ★6.

PL SC 505. *Research Projects in Plant Breeding.* Weight according to work done to a maximum of ★6.

PL SC 515. *Reading Projects — Forages.* Weight according to work done to a maximum of ★6. Discussion of topics from the literature on native range and cultivated pasture management. Prerequisite: PL SC 471 or PL SC 472 or equivalent.

PL SC 516. *Research Projects — Forages.* Weight according to work done to a maximum of ★6. A range of projects concerned with winter hardiness, forage quality and pasture ecology is available for study in the greenhouse, growth chambers or the forage quality lab. Suitable for graduate and undergraduate study. Prerequisites: PL SC 471 or PL SC 472, or equivalent.

34.31.4 HORTICULTURE

PL SC 341. *General Horticulture.* ★3 (Second Term, 3-0-3). Elementary course designed for those students who do not wish specialized instruction in the various phases of horticulture. A survey of horticulture, with an introduction to the theories of nutrition, modification of environment and utilization of horticultural plants. Laboratory work in propagating, cultural, and marketing procedures and in landscape horticulture.

PL SC 350. *Principles of Horticulture.* ★3 (First Term, 3-0-3). A basic course in horticulture, with special emphasis on the physiology of horticultural crops. Laboratory practice in plant identification, propagation, culture, marketing and storage of crops; their economic importance and value as foods. Also an introduction to landscape horticulture. Prerequisite: BIOL 130 or equivalent; INT D 230 recommended.

PL SC 454. *Fruit Crops.* ★3 (Second Term, 3-0-3). Prerequisite: PL SC 350 or equivalent.

PL SC 455. *Vegetable Crops.* ★3 (Second Term, 3-0-3). Prerequisite: PL SC 350 or equivalent.

PL SC 457. *Greenhouse Crops.* ★3 (Second Term, 3-0-3). Prerequisite: PL SC 350 or equivalent.

PL SC 458. *Herbaceous Ornamentals.* ★3 (First Term, 3-0-3). Classification, propagation, culture and landscape use of herbaceous ornamental plants. Prerequisite: PL SC 350 or equivalent.

PL SC 459. *Woody Ornamentals.* ★3 (First Term, 3-0-3). Identification, culture and landscape uses of trees, shrubs and ground covers. Planting design and use of landscape architectural conventions. Prerequisite: PL SC 350 or equivalent.

PL SC 460. *Landscape Architecture.* ★3 (First Term, 3-0-3). Elements and principles of design; and application to problems in landscape design.

PL SC 461. *Problems in Landscape Architecture.* ★3 (Second Term, 0-6L-0). Design problems chosen from a variety of sources to provide the opportunity to react to a number of quite different parameters. Approximately 1/3 of the problems will also involve the choice and use of plant materials. Prerequisites: PL SC 458 and PL SC 460.

PL SC 507. *Reading Projects in Horticulture.* Weight according to work done to a maximum of ★6. Library study and regular meetings for discussion.

PL SC 508. *Research Projects.* Weight according to work done to a maximum of ★6.

PL SC 509. *Selected Topics in Horticulture.* Weight according to work done to a maximum of ★6. Recent developments of special interest discussed at an advanced level.

34.31.5 PLANT PATHOLOGY

PL SC 380. *Principles of Plant Pathology.* ★3 (First Term, 3-0-3). An introduction to plant diseases; the nature of nonparasitic and parasitic causal agents such as air pollutants, temperature, viruses, bacteria, fungi, higher plants and nematodes; principles involved in disease prevention and control. Prerequisite: INT D 230.

PL SC 381. *Diseases of Field Crops.* ★3 (Second Term, 3-0-3). Diseases of grain, forage, and other field crops. Prerequisite: PL SC 380.

PL SC 382. *Diseases of Horticultural Crops.* ★3 (Second Term, 3-0-3). Diseases of potato, vegetable, fruit, and ornamental plants. Prerequisite: PL SC 380.

PL SC 385. *Forest Pathology.* ★3 (First Term, 3-0-3). An introduction to forest diseases; the nature of non-parasitic and parasitic causal agents such as air pollutants, temperature, fungi, bacteria, nematodes and higher plants; important forest tree and shrub diseases; principles involved in disease prevention and control.

PL SC 510. *Plant Virology.* ★3 (First Term, 3-0-3). Basic principles and methods dealing with morphology, purification, multiplication, mutation, and transmission of plant viruses. Prerequisite: Consent of instructor.

PL SC 511. *Reading Project.* Weight according to work done to a maximum of ★6. A written report on a selected project.

PL SC 512. *Research Projects.* Weight according to work done to a maximum of ★6.

PL SC 635. *Plant Pathogenesis.* ★3 (First Term, 3-0-0). A critical review of literature related to the physiology of diseased plants, e.g., effect on growth, disintegration of tissue, wilting, and changes in respiration. Prerequisite: Consent of instructor.

PL SC 636. *Plant Pathogenesis.* ★3 (Second Term, 3-0-0). A continuation of Plant Science 635; histological, physiological and biochemical defense mechanisms, toxins, fungicidal action. Prerequisite: Consent of instructor.

34.31.6 PLANT PHYSIOLOGY AND BIOCHEMISTRY

PL SC 400. *Physiology and Biochemistry of Crop Plants.* ★3 (Second Term, 3-0-0). Prerequisite: CHEM 250 or 350.

PL SC 431. *Plant Biochemistry.* ★3 (First Term, 3-0-3). An introduction to biochemistry. Basic biochemical similarity of all organisms. Ways of studying biochemical reactions. Natures and kinds of enzymes; qualitative aspects of rates of enzyme catalyzed reactions. Derivation of energy through degradative processes. Chemistry and metabolism of carbohydrates and fats and oils. Prerequisite: CHEM 250 or 350, or equivalent.

PL SC 432. *Plant Biochemistry.* ★3 (Second Term, 3-0-3). A continuation of Plant Science 431. Emphasis is on the utilization of energy for synthetic processes. Chemistry and biochemistry of cellular structures. Isoprenoids and steroids. Photosynthesis. Nitrogen and protein biochemistry. Enzyme kinetics. Regulation and control of chemical reactions in living organisms. Prerequisite: PL SC 431 or equivalent.

PL SC 513. *Reading Projects in Plant Physiology and Biochemistry.* Weight according to work done to a maximum of ★6.

PL SC 514. *Research Projects in Plant Physiology and Biochemistry.* Weight according to work done to a maximum of ★6.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). (See § 34.23.)

34.32 Poultry Science

Department of Animal Science

For courses in Poultry Science see § 34.6.2.

34.33 Psychology

NOTE: Students with credit in Psychology 202/212, or Educational Psychology 269/271 may not take Psychology 260 or 261 for degree credit. Psychology 261 replaces Psychology 237, 241 and 283.

PSYCO 260. *Basic Psychological Processes.* ★3 (either term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 420. *Principles of Psychology.* ★3 (either term, 3-0-0). Basic concepts and principles of psychology. Prerequisite: Third or fourth year, or graduate standing. Note: Carries no credit for students with credit in any of PSYCO 202, 212, 237, 241, 260, 261, or 283.

34.34 Rural Sociology

Department of Rural Economy

R SOC 355. *Principles of Rural Sociology.* ★3 (either term, 3-0-0). The basic principles and concepts of sociology as they apply to the study of rural life; concepts of culture, social organization, population and ecology and social institutions are taught with rural examples. Formerly R SOC 256. Note: Open to first year students. Not open to students with credit in SOC 202.

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). (See § 34.23.)

R SOC 391. *Principles of Rural Extension.* ★3 (First Term, 3-0-0). Introduction to concepts involved in organizing and implementing effective programs for social change in rural communities. The processes by which farm and rural people learn about, try out and adopt or reject new ideas and innovations. Development of an appreciation for the multidisciplinary nature of the rural extension function. Prerequisite: Third year standing or higher.

R SOC 415. *Socio-Economic Research Techniques.* ★3 (either term, 3-0-2). Research design, language of research, sample selection, questionnaire construction, interviewing, machine tabulation, analysis, and report writing. Designed for graduate students.

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). (See § 34.23.)

INT D 458. *Socio-economic Development of Western Canadian Agriculture.* ★3 (First Term, 3-0-0). (See § 34.23.)

R SOC 491. *Planning and Evaluation of Extension Programs.* ★3 (Second Term, 3-0-0). The nature and importance of and principles involved in planning, programming, implementation, and evaluation; knowledge, skills and attitudes required of professional workers engaged in human resources development and extension work. Prerequisite: R SOC 391 or equivalent.

R SOC 556. *Human Resources Development.* ★3 (First Term, 3-0-0). The role of human resources in social and economic development. Strategies for development of knowledge; skills and attitudes desirable in the development process. Training

of change agents and lay leaders for community development and continuing education process. Prerequisite: Consent of instructor.

R SOC 557. *Comparative Rural Societies.* ★3 (Second Term, 3-0-0). The structure and characteristics of rural societies in various countries, with emphasis upon adjustment to change in social and economic institutions. Prerequisite: Consent of instructor; INT D 456 recommended.

NOTE: 34.35 Reserved.

34.36 Sociology

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 403. *Principles of Sociology.* ★3 (either term, 3-0-0). Basic concepts and principles of Sociology for students with advanced standing. Prerequisite: Senior or graduate standing. Note: May not be taken for credit by students with credit in SOC 202.

34.37 Soil Science

SOILS 302. *Principles of Soil Science.* ★3 (First Term, 3-0-0). An introduction to soil components and their properties. Concepts of soil dynamics in different ecological systems. Formation and classification of major soil groups of Canada and the world. A review of world soil resources. Primarily designed for students in faculties other than Agriculture and Forestry.

SOILS 310. *Introduction to Soil Science.* ★3 (First Term, 3-0-3). Soil components; important physical and chemical properties; elementary aspects of soil formation and classification, soil biology, soil moisture and soil air. Prerequisite: A university level course in chemistry.

SOILS 316. *Soils and Man.* ★3 (Second Term, 3-0-0). Interaction of soil and man and optimum food production through suitable conservation practices. Constrictions in land use due to kinds of soils, soil fertility, soil moisture, soil erosion, soil physical factors and climate. Management of soil resources for human and animal food production under varying climatic constrictions with a review of the present and the prospects for the future. Primarily designed for students in faculties other than Agriculture and Forestry. Prerequisite: SOILS 302 or 310.

SOILS 330. *The Soil Ecosystem.* ★3 (Second Term, 3-0-0). Soil as an ecosystem; physical and chemical aspects of the soil environment; ecologically and pedologically significant aspects of soil organisms; functioning of the soil ecosystem; role of soil organisms in soil development. Prerequiste: An introductory course in Biology and SOILS 310 recommended.

SOILS 360. *Soil Management and Conservation.* ★3 (Second Term, 3-3s-0). An applied course which considers the relationship of soil properties to the use and management of soils for agriculture. Topics include soil tilth, soil water, soil temperature, soil pH, soil salinity, soil deterioration and erosion. Soil management practices including amelioration of problem soils, maintenance of organic matter and erosion control are discussed. Prerequisite: An introductory course in Soil Science. Note: Not to be taken for credit by students with credit in SOILS 312.

SOILS 401. *Research Project.* Weight according to work done to a maximum of ★6. Field and/or laboratory study under staff supervision of a specialized topic, requiring the preparation of a comprehensive report; primarily for fourth-year students. Prerequisite: Consent of the Department Chairman.

SOILS 415. *Inorganic Soil Components.* ★3 (Second Term, 3-0-3). Mineral components of soil with emphasis on weathering processes in different soil environments; influence of inorganic components on soil behavior; nature of crystalline and amorphous soil clays; significance of mineral formation in soils. Arrangement of soil components into microfabric types. Prerequsite: SOILS 302 or 310; GEOL 202 recommended.

SOILS 420. *Soil Formation and Classification.* ★3 (First Term, 3-0-3). Soil formation and classification with emphasis on environmental forces, including man's activity, as factors of soil pedogenesis. Soil Cartography purposes and methods. Soils of Canada — kinds, distribution and use. Prerequisite: An introductory course in soil science, ecology or geology.

SOILS 425. *Soil and Land Evaluation.* ★3 (Second Term, 3-0-3). Principles and techniques of soil/land evaluation including land classification based on inherent characteristics, present land use/land cover, and land capabilities for alternate land use; assessment of soil quality from morphological, chemical and physical data; use of soil survey data in agriculture, forestry and engineering. Prerequisite: SOILS 420 or equivalent.

SOILS 430. *Soil Microbiology and Biochemistry.* ★3 (Second Term, 3-0-3). Organic components of soil, and their microbial transformations. Nitrogen, phosphorus and sulphur cycles in the biosphere. Interactions between soil microflora and pesticides and other foreign materials added to soil. The microbiological factor in biogeochemistry. The laboratory is designed to introduce students to modern methods of evaluating the activity of the soil microflora. Prerequisite: MICRB 315 or equivalent.

SOILS 440. *Soil Physics.* ★3 (First Term, 3-0-3). Physical properties of soil affecting its structural, mechanical and thermal behavior and their quantitative measurements; fundamental principles and laws which govern the soil as a physical system with particular emphasis on the character, measurement and movement of soil moisture. Prerequisite: An introductory course in one of the earth sciences.

SOILS 450. *Soil Chemistry.* ★3 (First Term, 3-0-3). Mechanisms, equations and adsorption, adsorption isotherms, cation exchange capacity, variable and permanent charge, cation and anion fixation and rates of reaction, adsorption of polymers, solute transport, oxidation and reduction, flocculation and dispersion, chemistry of sodium, calcareous and acid soils, soil pollution, adsorbed water. Prerequisite: SOILS 310 or equivalent.

SOILS 460. *Soil Fertility.* ★3 (First Term, 3-0-3). Essential plant nutrients; factors influencing nutrient availability; methods of evaluating soil fertility; correction of soil fertility problems; manufacture, composition, and use of fertilizers. Prerequisite: SOILS 310 or equivalent.

SOILS 470. *Land Drainage.* ★3 (Second Term, 3-0-0). Principles of land drainage; drainage design criteria; design of surface and subsurface drainage systems; drainage investigations; current drainage practices. Prerequisite: SOILS 440 or equivalent. (Offered jointly with Department of Agricultural Engineering).

SOILS 485. *Soil Reclamation and Conservation.* ★3 (Second Term, 2-4s-0). A problem and seminar oriented course providing an opportunity for students to integrate past course experiences and to strengthen the concept of the total system approach to analysis of soil problems and management strategies. Includes examination and analysis of soil reclamation and/or management problems, preparation of a report or action plan and defence of it to several staff of the Department of Soil Science. Grade assigned on the basis of written report(s) and its (their) defense. Prerequisite: Four (4) Soil Science areas beyond SOILS 310.

SOILS 501. *Individual Study.* Weight according to work done to a maximum of ★6. Field and/or laboratory study under staff supervision of a specialized topic, requiring the preparation of a comprehensive report; for graduate students only. Prerequisite: Consent of the Department Chairman.

SOILS 502. *Individual Study.* Weight according to work done to a maximum of ★6. Description same as SOILS 501.

SOILS 503. *Individual Study.* Weight according to work done to a maximum of ★6. Description same as SOILS 501.

SOILS 504. *Individual Study.* Weight according to work done to a maximum of ★6. Description same as SOILS 501.

NOTE: Except for SOILS 600 the following courses are offered only when justified by enrolment, normally in alternate years.

SOILS 520. *Advanced Soil Classification.* ★3 (Second Term, 3-0-3). Systematics of soil classification throughout the world with special emphasis on pedogenesis, classification, distri-

bution and use of soils outside of Canada. Prerequisite: SOILS 420.

SOILS 530. *Advanced Soil Microbiology.* ★3 (First Term, 3-0-3). Microbiology of organic matter decomposition and humus formulation; microbiology of nitrogen and mineral transformations, bacteriophages, and predatory micro-organisms. Prerequisite: SOILS 430 or equivalent.

SOILS 535. *Advanced Soil Biochemistry.* ★3 (Second Term, 1.5-1.5s-3). A lecture and seminar course on special topics from the recent literature in soil biochemistry; intensive literature review and laboratory project on some aspect of the topics discussed. Prerequisite: SOILS 430.

SOILS 540. *Advanced Soil Physics.* ★3 (First Term, 3-0-3). Fundamental equations governing the flow of fluids through porous media; examination of solution techniques including physical and analogue models, analytical and numerical techniques with application to such physical processes as infiltration, moisture redistribution, drainage and evaporation. Prerequisites: An introductory course in differential calculus and a course in one of the following: soil physics, soil mechanics, or hydrogeology.

SOILS 550. *Advanced Soil Chemistry.* ★3 (Second Term, 3-0-3). More complex chemical reactions and properties of soil systems. Prerequisite: Consent of instructor.

SOILS 555. *Soil Mineralogy.* ★3 (Second Term, 3-0-3). Primary and secondary soil forming minerals; their identification, occurrence, stability, and weathering with emphasis on clay minerals. Prerequisites: SOILS 415 and 420 or equivalent.

SOILS 600. *Seminar.* ★1 (0-1s-0). Note: Attendance required of all graduate students.

SOILS 620. *Experimental Pedology.* ★3 (Second Term, 3-0-3). A review of the more important classical research contributions in the area of experimental pedology. The *scientific method* as applied to research in experimental pedology. Prerequisites: SOILS 520, 535 and 555 or equivalent.

SOILS 900. *Non-Thesis Project.* ★variable (variable). Required of all M.Ag. candidates majoring in Soil Science in the year in which they expect to obtain their degree and involving the preparation and presentation of a research report.

34.38 Statistics

STAT 241. *Introduction to Statistics.* ★3 (either term, 3-0-2). Random variables and frequency distributions. Averages and variance. The binomial and normal distribution. Sampling distributions and elementary inference. The XA Q2A test for contingency tables. Regression and correlation. Analysis of variance. Prerequisite: Mathematics 30 or consent of the Department. This course may not be taken for credit if credit has already been obtained in any of STAT 255, 335, 336, 337, 365.

STAT 337. *Biostatistics.* ★3 (either term, 3-0-1). Frequency distributions, measures of central tendency and dispersion, methods of sampling biological populations, sampling distributions, elementary inference on means and proportions, analysis of variance, regression and correlation, contingency tables. The concepts will be motivated by problems in the life sciences. Difficulties in actual applications will be stressed. Prerequisite: Mathematics 30 or consent of the department. This course may not be taken for credit if credit has already been obtained in any of STAT 241, 255, 336, 365.

34.39 Veterinary Science

Department of Animal Science

For courses in Veterinary Science see § 34.6.3.

34.40 Zoology

ZOOL 325. *Comparative Anatomy of the Vertebrates.* ★3 (First Term, 3-0-3). Comparative anatomy of the vertebrates with special emphasis on the mammals. Prerequisites: Two of BIOL 296, 297, 298 or 299, or BIOL 130 and one of BIOL 296, 297, 298 or 299 taken as a corequisite, or consent of the Department.

ZOOL 326. *Biology of the Vertebrates.* ★3 (Second Term, 3-0-3). Topics in vertebrate biology, including zoogeography, population ecology, reproduction and structural and behavioral adaptations. Prerequisite: ZOOL 325 strongly recommended, or consent of the Department.

ZOOL 466. *Boreal Ecology II.* ★3 (Second Term, 3-0-0). Terrestrial and aquatic ecosystems of the north, emphasizing special features of the environment and biotic responses. Prerequisite: BIOL 298, or consent of the Department. Note: For Boreal Ecology I see GEOG 465, 466.

ZOOL 467. *Wildlife Conservation.* ★3 (First Term, 3-0-3). Principles and concepts involved in the conservation and management of wild birds and mammals. Prerequisite: ZOOL 406 and 408, or ZOOL 404, or AN SC 351 and consent of the Department.

Faculty of Arts

41 INTRODUCTORY

41.1 Members of the Faculty

41.1.1 OFFICERS OF THE FACULTY

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E. REINHOLD, Ph.D.

Associate Dean, Humanities and Fine Arts
R. G. MOYLES, Ph.D.

Associate Dean, Social Sciences
S. M. M. QURESHI, Ph.D.

Assistant Dean
M. JENDYK, L.U.D.

Assistant Director, Student Programs
R. J. MIDDLEDITCH, B.A.

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(Assistant to the Dean)
V. A. STOBEE, B.Ed.
(Student Programs)
S. McLEAN-BOWERS, B.A. (Faculty Secretary)

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B. G. DAHLBY, Ph.D.
M. G. J. HELLSTEN, M.A.
C. C. NUNN, M.Sc.
T. TSUSHIMA, Ph.D.

Joint Appointments With Business Administration and Commerce

R. BECK, Ph.D.
R. MIRUS, Ph.D.
G. B. RESCHENTHALER, Ph.D.
R. S. SMITH, Ph.D.

Joint Appointment with Health Services Administration

R. H. M. PLAIN, Ph.D.

Joint Appointments with Rural Economy

M. R. CARROLL, Ph.D.
T. S. VEEMAN, Ph.D.
A. A. WARRACK, Ph.D.

Administrative Officer

J. M. McDONALD

41.1.8 DEPARTMENT OF ENGLISH

Professor and Chairman

R. F. ANDERSON, Ph.D.

Professors

R. F. AYLING, Ph.D.
R. G. BALDWIN, Ph.D. (Vice-President, Academic)
D. E. BESSAI, Ph.D.
J. W. BILSLAND, Ph.D.
L. W. CONOLLY, Ph.D.
B. N. DE LUNA, Ph.D.
C. Q. DRUMMOND, Ph.D.
J. F. FORREST, Ph.D.
R. J. S. GRANT, Ph.D.
H. A. HARGREAVES, Ph.D.
R. T. HARRISON, Ph.D.
J. F. LAUBER, Ph.D.
G. S. McCAUGHEY, M.A.
J. S. McMASTER, Ph.D.
R. D. McMASTER, Ph.D.
R. G. MOYLES, Ph.D.
J. O. ORRELL, Ph.D.
N. A. PAGE, Ph.D.
A. H. QURESHI, Ph.D.
E. J. ROSE, Ph.D.
S. ROSE, Ph.D.
M. L. ROSS, Ph.D.
S. A. C. SCOBIE, Ph.D.
R. G. SIEMENS, Ph.D.
R. H. WIEBE, M.A.
R. R. WILSON, Ph.D.

Associate Professors

B. L. ALMON, Ph.D.
D. F. BARBOUR, Ph.D.
C. J. BULLOCK, Ph.D.
P. CLEMENTS, D.Phil.
J. D. W. CROWTHER, Ph.D.
L. T. FITZ, Ph.D.
C. GORDON-CRAIG, Ph.D.
R. HOFFPAUIR, Ph.D.
D. A. JACKEL, Ph.D.
G. D. KELLY, D.Phil.
M. R. LEGRIS, Ph.D.
J. A. MacINTYRE, Ph.D.
L. N. McKILL, Ph.D.
R. J. MERRETT, Ph.D.
J. M. NELSON, Ph.D.
N. J. PARKER-JERVIS, B.A., Dip.Ed.
F. L. RADFORD, Ph.D.
S. REES, Ph.D.
R. H. SOLOMON, Ph.D.
S. E. STAMBAUGH, Ph.D.
J. C. STOTT, Ph.D.
W. G. WATSON, Ph.D.
M. A. WHITAKER, Ph.D.
M. D. WILKIE, Ph.D.

Assistant Professors

F. D. CLANDFIELD, M.A.
P. A. DEMERS, Ph.D.
G. A. F. HOLLINGSHEAD, Ph.D.
J. G. MARINO, Ph.D.

B. J. MITCHELL, Ph.D.
S. C. NEUMAN, Ph.D.
E. W. PITCHER, Ph.D.
G. SAMUEL, Ph.D.

Administrative Officer
M. A. DAVISON

41.1.9 DEPARTMENT OF GERMANIC LANGUAGES

Professor and Chairman
G. MARAHRENS, Ph.D.

Professors
R. J. E. d'ALQUEN, Ph.D.
E. EGERT, Ph.D.
A. PRELORENTZOS, Ph.D.
E. REINHOLD, Ph.D.

Associate Professors
C. S. HALE, Ph.D.
H. A. PAUSCH, Ph.D
M. PROKOP, Ph.D.
R. G. WHITINGER, Ph.D.

41.1.10 DEPARTMENT OF HISTORY

Associate Professor and Chairman
R. C. MACLEOD, Ph.D.

Professors
F. D. BLACKLEY, Ph.D.
F. A. de LUNA, Ph.D.
B. L. EVANS, Ph.D.
R. R. HETT, Ph.D.
H. J. JONES, Ph.D.
W. J. JONES, Ph.D.
H. P. LIEBEL-WECKOWICZ, Ph.D.
G. A. ROTHROCK, Ph.D.
I. L. RUDNYTSKY, Ph.D.
A. THIMME, D.Phil.
L. H. THOMAS, Ph.D.
U. TRUMPENER, Ph.D.

Associate Professors
O. P. DICKASON, Ph.D.
D. H. DINWOODIE, Ph.D.
J. A. EAGLE, Ph.D.
J. E. FOSTER, Ph.D.
D. J. HALL, Ph.D.
R. HAMOWY, Ph.D.
D. C. JOHNSON, Ph.D.
M. KATZ, Ph.D.
D. J. MOSS, D.Phil.
K. J. MUNRO, Ph.D.
S. R. MUNRO, M.A.
D. R. OWRAM, Ph.D.
P. E. PRESTWICH, Ph.D.
C. M. SMALL, B.Litt.
B. M. SMITH, Ph.D.
K. C. TAYLOR, Ph.D.
J. N. WICKENDEN, Ph.D.

Assistant Professors
D. L. LIGHTNER, Ph.D.
C. S. MACKINNON, Ph.D.
K. OHTA, M.A.
W. R. SAMPSON, M.A.
H. E. WILSON, Ph.D.

Administrative Officer
B. A. FLORCHYK

41.1.11 DEPARTMENT OF MUSIC

Professor and Chairman
R. A. STANGELAND, D.M.A.

Professors
M. BOWIE
H. F. BRAUSS
A. B. CRIGHTON, D.M.A.
L. V. FISHER, M.Mus.
M. D. FORSYTH, D.Mus.
C. E. KENNESON, M.Mus.
G. KRAPF, M.Mus.
E. B. LEJANO, D.M.A.
G. E. LINCOLN, L.R.S.M.
A. M. MUNN, Dip. (Juilliard)
R. N. NELSON, Dip. R.C.M. (Lond.)
M. SASONKIN, Ph.D.

Associate Professors
L. D. COOK, Ph.D.
A. J. FISHER, Ph.D.
B. L. HARRIS, Ph.D.
F. C. PIER, D.M.A.
M. T. ROEDER, Ph.D.
A. STROMBERGS, A.R.C.T.
H. H. WIENS, Dip. (DETMOLD)

Assistant Professors
E. R. DALWOOD, A.Mus.
J. L. MOORE, L.R.S.M.
A. J. ORD, D.M.A.

Lecturer
W. P. BERG, Ph.D.

Joint Appointments
E. H. FILIPKOWSKI, M.A.
A. A. SMITH, D.M.A.

Librarian
J. WHITTLE, B.L.S.

Administrative Officer
J. A. BRAY, M.Mus.

41.1.12 DEPARTMENT OF PHILOSOPHY

Associate Professor and Chairman
J. C. MacKENZIE, M.Litt.

Professors
R. N. BOSLEY, Ph.D.
J. KING-FARLOW, Ph.D.
P. A. SCHOULS, Ph.D.
R. A. SHINER, Ph.D.
H. TENNESSEN, Magister
F. P. van de PITTE, Ph.D.

Associate Professors
A. A. CARLSON, Ph.D.
F. M. CHRISTENSEN, Ph.D.
W. E. COOPER, Ph.D.
W. EASTMAN, Ph.D.
F. J. PELLETIER, Ph.D.
M. M. van de PITTE, Ph.D.

Assistant Professors
B. A. HUNTER, Ph.D.
B. LINSKY, Ph.D.
W. D. SHARP, Ph.D.

41.1.13 DEPARTMENT OF POLITICAL SCIENCE

Professor and Chairman
R. E. McKOWN, Ph.D.

University Professor
L. C. GREEN, LL.D.

Professors
F. C. ENGELMANN, Ph.D.
J. P. MEEKISON, Ph.D.
T. C. POCKLINGTON, Ph.D.
S. M. M. QURESHI, Ph.D.

Associate Professors
R. E. BAIRD, Ph.D.
D. J. C. CARMICHAEL, Ph.D.
L. H. CRAIG, Ph.D.
G. DACKS, Ph.D.
R. R. GILSDORF, Ph.D.
F. G. HULMES, Ph.D.
J. P. JOHNSTON, M.A.
J. A. LEJNIEKS, Ph.D.
J. W. LIGHTBODY, Ph.D.
J. K. MASSON, Ph.D.
M. E. MOTE, Ph.D.
L. R. PRATT, Ph.D.
G. STEVENSON, Ph.D.

Assistant Professors
D. B. DEWITT, Ph.D.
E. P. MURRAY, M.A.
A. TUPPER, Ph.D.

41.1.14 DEPARTMENT OF PSYCHOLOGY

Professor and Chairman
T. M. NELSON, Ph.D.

Professors
C. M. BOURASSA, Ph.D.
D. W. CURTIS, Ph.D.
L. V. DI LOLLO, Ph.D.
E. HOWARTH, Ph.D.
W. W. ROZEBOOM, Ph.D.
B. G. RULE, Ph.D.
S. J. RULE, Ph.D.
W. N. RUNQUIST, Ph.D.
P. SWARTZ, Ph.D.
T. E. WECKOWICZ, Ph.D.

Associate Professors
C. H. BECK, Ph.D.
E. H. CORNELL, Ph.D.
D. W. CURTIS, Ph.D.
A. R. DOBBS, Ph.D.
M. E. ENZLE, Ph.D.
D. L. KUIKEN, Ph.D.
E. C. LECHELT, Ph.D.
D. G. PERRY, Ph.D.
P. A. RUNQUIST, Ph.D.
B. K. SINHA, Ph.D.
D. SPEARMAN, Ph.D.
R. E. WALLEY, Ph.D.
K. V. WILSON, Ph.D.

Assistant Professors
J. H. BISANZ, Ph.D.
W. F. EPLING, Ph.D.
A. R. FRIEDMAN, Ph.D.
D. S. GRANT, Ph.D.
D. C. HETH, Ph.D.
G. L. WELLS, Ph.D.

Administrative Officer
J. A. BROWNE, Ph.D.

Research Associate
T. H. NILSSON, Ph.D.

41.1.15 DEPARTMENT OF RELIGIOUS STUDIES

Associate Professor and Chairman
K. D. PRITHIPAUL, Ph.D.

Professor
P. JOSEPH CAHILL, S.T.D.

Associate Professors
M. WAIDA, Ph.D.
E. H. WAUGH, Ph.D.

Assistant Professor
M. A. MORGAN, M.A.

Joint Appointment with Anthropology
M. M. YOUNG, Ph.D.

41.1.16 DEPARTMENT OF ROMANCE LANGUAGES

Associate Professor and Chairman
J. A. CREORE, M.A.

Professors
A. B. CONNELL, D.U.
C. A. DIMIC, Ph.D.
J. FERRATE, Lic. en Let.
A. M. FORCADAS, Ph.D.
P. A. R. MONOD, Doct. T.C.
C. H. MOORE, D.U.
R. G. MOTUT, Ph.D.
D. MUSACCHIO, Doct. T.C.
B. L. ROCHET, Ph.D.
R. W. F. WILCOCKS, Ph.D.

Associate Professors
J. E. ALGEO, Ph.D.
M. G. BADIR, Ph.D.
A. J. BALLAH, M.A.
M. L. BAREAU, Doct. T.C.
N. E. BONVALET, Doct. T.C.
R. C. BONVALET, Doct. T.C.
C. K. A. COLTER, B.A.
J. M. DUCIAUME, M.A.
D. P. FEARON, M.A.
A. J. HOLDEN, M.A.
D. J. LANGDON, Ph.D.
E. MARXHEIMER, M.A.
E. MUSACCHIO, Dott. Fil.
P. A. ROBBERECHT, M.A.
R. S. THORNBERRY, Ph.D.
R. A. YOUNG, Ph.D.

Assistant Professors
M. KALINOWSKY, M.A.
P. L. KNIGHT, M.A.
L. K. PENROD, Ph.D.
J. VARELA, B.A.
M. VERDICCHIO, M.Phil.

Administrative Officer
J. K. PANTELUK, B.A.

41.1.17 DEPARTMENT OF SLAVIC LANGUAGES

Associate Professor and Chairman
T. M. S. PRIESTLY, Ph.D.

Professors
E. MOZEJKO, Ph.D.
Y. SLAVUTYCH, Ph.D.
O. ZUJEWSKYJ, Ph.D.

Associate Professors
R. L. BUSCH, Ph.D. (Director, Division of East European Studies)
T. R. CARLTON, Ph.D.
K. T. HOLDEN, Ph.D.
B. MEDWIDSKY, Ph.D.

Assistant Professor
P. A. ROLLAND, Ph.D.

Joint Appointment
A. HORNJATKEVYC, Ph.D.

41.1.18 DEPARTMENT OF SOCIOLOGY

Associate Professor and Chairman
R. A. SILVERMAN, Ph.D.

Professor Emeritus
G. NETTLER, Ph.D.

Professors
B. R. ABU-LABAN, Ph.D.
C. CALDAROLA, Ph.D.
A. K. DAVIS, Ph.D.
J. FORSTER, Ph.D. (Dean of Graduate Studies)
J. C. HACKLER, Ph.D.
T. F. HARTNAGEL, Ph.D.
G. K. HIRABAYASHI, Ph.D.
C. W. HOBART, Ph.D.
P. KRISHNAN, Ph.D.
K. J. KROTKI, Ph.D.
L. E. LARSON, Ph.D.
A. J. MATEJKO, Ph.D.
N. STEHR, Ph.D.
T. H. WHITE, Ph.D. (Dean of Arts)

Associate Professors
S. M. ABU-LABAN, Ph.D.
K. R. CUNNINGHAM, B.A.
G. F. N. FEARN, Ph.D.
J. W. GARTRELL, Ph.D.
M. W. GILLESPIE, Ph.D
W. A. HARRELL, Ph.D.
G. K. JARVIS, Ph.D.
R. JUNG, Ph.D.
L. W. KENNEDY, Ph.D.
W. W. McVEY, Jr., Ph.D
W. A. MELOFF, Ph.D.
A. S. A. MOHSEN, Ph.D.
R. S. PANNU, Ph.D.
J. A. SARAM, Ph.D.
E. L. SNIDER, Ph.D.
R. A. SYDIE, Ph.D.
J. R. YOUNG, M.Ed.

Assistant Professors
J. A. GOLEC, Ph.D.
L. A. HAYDUK, Ph.D.
G. S. LOWE, Ph.D.
H. C. NORTHCOTT, Ph.D.
W. D. PIERCE, Ph.D.

Lecturer
J. J. CREECHAN, M.A.

Professional Officer
K. W. SPENCE

Service Officer
N. M. LALU, Ph.D.

41.1.19 SUPPORTING SERVICES: LANGUAGE LABORATORIES

Director
A. BALLAH, M.A.

Co-ordinator (Administrative and Professional Officer)
G. VERBURG

41.2 Important Deadlines and General Information

41.2.1 THE FACULTY OF ARTS

The Faculty of Arts is, with the Faculty of Science, the oldest established faculty at The University of Alberta, instruction in Arts and Science having begun in 1908. It offers instruction in the humanities, the social sciences, and the fine arts.

The Faculty offers a variety of programs leading to the degree of B.A. (Honors), B.A. (Special) [including Asian Studies], B.A. (Canadian Studies) and B.A. (General) [a three-year program]. Regulations governing Honors, General, and Special programs will be found in § § 43.1.1 to 43.1.9 followed by descriptions of these programs under subject headings in § § 43.2 to 43.23.

In addition, the Faculty offers specialized degrees in Art and Design, and in Drama (Bachelor of Fine Arts) described in § § 43.1.11 and 43.1.12, and in Music (Bachelor of Music), described in § 43.1.13.

41.2.2 FACULTÉ SAINT-JEAN

A number of Arts courses are also offered in French at Faculté Saint-Jean. Faculté Saint-Jean was founded in 1908 and became an integral part of the University in 1970. Faculté Saint-Jean allows students of French extraction to pursue their university studies in a French environment and gives other students the opportunity to benefit from this environment. The University thus hopes to foster French culture in Alberta and to allow more students to master the two official languages of Canada. For further information, consult the calendar of Faculté Saint-Jean § § 171 to 228.

41.2.3 IMPORTANT DEADLINES

(a) *Admission to the University:*

All programs except BFA: September term: July 2nd; January term: Dec. 1st.

Non-matriculated adults: September term: June 1st; January term: Oct. 1st.

Students are not normally admitted to B.Mus. or B.F.A. programs in January.

B.F.A. (Drama) Acting or Design: April 1st; B.F.A. (Art and Design): May 1st.

Note: Fine Arts or Music program students must also apply to the department concerned. Students seeking admission to music "performance" courses must apply for audition by August 4.

(b) *Transfer to the Faculty of Arts from another faculty in the University:*

For September admission: August 14th; for January admission: December 1st. First year students who registered in September in another faculty may not transfer for January admission, but will be considered for admission to the following session.

(c) *Advance Registration:*

Continuing students in B.A., B.F.A., or B.Mus. programs: April 30th.

Transfer to Honors, B.F.A. or B.Mus. programs within the Faculty: June 4th.

First year students or transfers from other faculties or universities must register in person in September (but note admission deadlines, above).

On campus evening credit or late afternoon classes: Aug. 12th.

(d) *Withdrawal from University:*

Formal notice is required. See § 15.2.5 of the University Regulations and information for Students Calendar for fee assessment.

(e) *Addition of courses to a student's program or changing from 'audit' to 'credit':*

Full session and First Term courses: Sept. 17th; Second Term courses: Jan. 11th.

(f) *Dropping courses from a student's program or changing from 'credit' to 'audit'.*

First Term courses: Nov. 12th; Full session courses: Feb. 12th; Second Term courses: Mar. 1st.

(g) *Application for regular supplemental or deferred final examinations:*

To be written August 4-8th: July 3rd; to be written after First Term: Mar. 17th.

(h) *Application to receive a degree:*
At Spring Convocation: December 15th; at Fall Convocation: September 30th.

(i) *Readmission after a failed year:*
Notification to Faculty and to Student Counselling Services that readmission for fall session is being sought: July 15th.

Note: Normally one year must elapse before readmission will be considered.

42 FACULTY REGULATIONS

42.1 Admission

The normal admission requirements of the Faculty of Arts will be found in § 13.4 of the University Regulations and Information for Students Calendar.

Language Requirement: A student admitted to any program in the Faculty of Arts, other than a B.F.A. program, must either present senior matriculation standing or equivalent in a language other than English or take such a course during the first year as part of the program. The decision as to whether or not the course will be accepted for degree credit rests with the Dean and depends on the nature of the deficiency.

Non-matriculated Applicants: Adult applicants (normally age twenty-one and over) who lack formal matriculation may seek special permission to enroll for a degree in the Faculty of Arts. Each application will be considered on its own merits by the Dean of the Faculty. Applicants must be residents of Alberta, the Yukon or the North West Territories who are citizens of Canada or Permanent Residents (Landed Immigrants). Successful completion of the normal first year of the B.A. program will stand in lieu of matriculation. An adult applicant who fails half, or more than half, of the five first-year courses, will be required to withdraw and must complete matriculation requirements before being considered for readmission. Interested applicants should submit an application form to the Registrar's Office before June 1st for September admission, and will normally be required to take tests administered by Student Counselling Services. All successful candidates for non-matriculated adult admissions will be required to include one course at the '100' level in a language other than English in their degree programs, if they have not already completed such a course at the matriculation level. (Note: The applicant may elect to complete the required language at the matriculation level, but not for degree credit.)

English Language Proficiency: All applicants for admission to the Faculty of Arts will be required to demonstrate proficiency in both written and spoken English, as a prerequisite to admission. This requirement pertains regardless of country of origin or citizenship status. The demonstration of proficiency may take one of several forms as described in § 14.3 of the University Regulations and Information for Students calendar. In the event that the Test of English as a Foreign Language [TOEFL] is the only appropriate means of meeting this requirement, the applicant must obtain a score of at least 600 in order to qualify for admission.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

Transfer from other faculties in the University: Any student in good standing in his or her past year's work in another faculty of The University of Alberta may transfer to the Faculty of Arts for the regular academic session by submitting a re-enrolment form to the Registrar's office (the deadline for re-enrolment may be found in the academic schedule at the front of this calendar). Advanced credit for course work already taken which is applicable to the Arts program will be given. Transferring students will be required to clear any matriculation deficiencies specific to the Faculty of Arts. This may be done by taking a suitable course, or courses, at the junior level. The student must register in these courses in the first year in the Faculty. Credit will be given for any one course taken to clear a specific matriculation deficiency, provided the transferring student already has clear matriculation to another faculty of the University and that the seven junior courses limit is not exceeded. Additional deficiencies must be cleared without credit.

Students with unsatisfactory standing in their past year's work in another faculty may be required to obtain a recommendation from Student Counselling Services before their application for transfer will be considered.

Transfer at mid-year (January) can be accepted only under special circumstances. Students who make a decision to transfer after the deadline for re-enrolment has passed should contact the Faculty of Arts office for advice. Even though formal transfer cannot be approved, changes in program can sometimes be arranged to maximize transferable credits for later use.

42.2 Registration and Changes of Registration

(1) *Registration and Changes of Registration.* The Faculty makes every effort to ensure that program requirements are being met by the courses in which a student is registered. However, the responsibility for completeness and accuracy of registration rests with the student, and students must satisfy themselves that their programs are in accordance with degree specifications (both at the time of registration and when changes of registration are made).

(2) *Changes of registration.* Adding of courses, dropping of courses, and changing from credit to audit and audit to credit, must be done within specified deadlines (§ 41.2.3) and on appropriate forms which can be obtained from the Faculty office.

NOTE: A student planning to drop all his/her courses in a term or session, must use the "Notice of Withdrawal" form (see § § 15.2.5 of the University Regulations and Information for Students calendar).

(3) *Failure to "drop" a course.* Students who do not formally withdraw from a course but who are absent from the final examination without excuse (see § 16.3.2 of the University Regulations and Information for Students Calendar) will be given a mark of zero (0) on

the final examination. The final grade in the course will then be determined by combining the appropriately weighted term grade and the assigned zero in the final examination, the mathematical result rounded to the lowest whole number. If the student is absent without excuse from the final examination and no grade for term work is available, a grade of absent failed (ABF) will be assigned. In establishing a student's grade point average, a grade of ABF is averaged as a grade of 1.

42.3 Classification and Selection of Courses

(1) Students beginning a B.A. (General), B.A. (Special), or B.A. (Canadian Studies) program in September 1979 and thereafter, will be required to include a course from each of the following categories in their program: Laboratory Science, Fine Arts, Humanities, and Social Sciences. For the purpose of this requirement, courses offered by the Faculty of Arts and Faculty of Science are categorized as follows:

(a) *Laboratory Science courses:* All laboratory courses offered by the Faculty of Science, which have the standard complement of lecture and laboratory hours, i.e., (3-0-3), plus Anthropology 390.

(i) *Full-Session courses:* Biology 130; Cartography 341; Chemistry 100, 200, 202, 250; Genetics 351 (a student may not receive degree credit for both Genetics 351 and Biology 297); Physics 240; Statistics 255.

(ii) *Single-Term courses:* Biology 210, 296, 297, 298, 299; Botany 314, 322, 331, 332, 341; Computing Science 214, 215, or 261, 262, or 351, 352; Entomology 207 or 209 (not both); Genetics 375, 380; Geography 230, 231; Geology 202, 203, or 390, 391; Linguistics 304, 307, 308; Microbiology 201, 315; Paleontology 418, 419; Physics 203, 205, 207, 209, 369; Psychology 360, 366, 475, 476. Note: Students with matriculation standing in a subject may not take the '100' level course in that subject for degree credit. Students with Physics 30 standing may not take Physics 203 for degree credit.

(b) *Fine Arts:* Classics 367/368 and all courses offered by the Departments of Art and Design, Drama and Music.

(c) *Humanities:* Courses offered in the following disciplines: Arabic; Chinese; Classics 201, 202, 260, 351, 357, 359, 360, 375, 379, 380, 481, 482, 483, 484, 485, 486, 498, 499; Christian Theology; Comparative Literature; English (the junior courses do not meet the requirement); French and French-Canadian; German; Greek; Hebrew; Hispanic Languages and Literatures; History (also classified under social sciences, but can only be counted in one or other category); Italian; Japanese; Latin; Old and New Testament Literature; Philosophy; Polish; Religious Studies (except courses listed under social sciences); Russian; Scandinavian; Slavics; Ukrainian.

(d) *Social Sciences:* Courses offered in the following disciplines: Anthropology; Classics (except courses listed under fine arts and humanities); Economics; Geography (except courses listed in the Faculty of Science offerings); German 306, 307, 406, 407; History (also listed under humanities, see note above); Linguistics (except courses listed in the Faculty of Science offerings); Political Science; Pyschology (except courses listed in the Faculty of Science offerings); Religious Studies 310, 322, 374, 375, 390, 460, 462; Romance Linguistics; Russian 453, 454, 511, 512; Slavics 301, 302, 403, 405, 407, 420, 421, 518, 522, 541, 542, 561, 562, 650; Sociology; Ukrainian 453, 511, 517.

(2) *Free Options* (courses from outside the Faculties of Arts and Science). Students registered in programs in the Faculty of Arts will normally select their courses from those set out in the combined calendar of Arts and Science. However, after satisfactory completion of his/her first year a student in the B.A. (Honors) program, B.A. (General) program, the B.A. (Special) program, or the B.A. in Canadian Studies may take up to two courses (as options) in faculties other than Arts and Science. In exceptional circumstances a third such course may be taken with approval of the Dean. These courses, when taken for credit toward the B.A. degree, are subject to the following restrictions:

(a) The courses must not duplicate, in central content, courses in the Faculties of Arts and Science.

(b) The courses may not be used to satisfy the requirements of a junior English course or the requirements set forth under 43.2(1) above.

(c) The courses may not be used to meet the requirements of a subject of concentration.

(d) Their inclusion in a program is subject to Faculty limitations on the number of junior courses and Science courses that may be offered for credit and the permissible number of courses in a subject of concentration.

(e) The courses must, in each case, carry a minimum weight of three (★3).

(f) Registration in these courses must be approved by the faculty in which they are offered.

(g) A grade of 4 in a prerequisite course represents the minimum requirement for admission to a course with a prerequisite requirement.

(3) *Single-term courses.* A number of courses are offered in one term only; two such courses are recognized as the equivalent of one full-session course. Where the curriculum requires a full-session course in a particular subject or classification, both single-term courses must be chosen from that subject or classification; where the requirement is for an option, any two single-term courses may be combined to meet the requirement.

(4) *Restricted Enrolment Courses:* The Faculty of Arts strives to accommodate all students wishing to enrol in a given course when it is appropriate to the student's program. However, classes in some courses must, for academic reasons, be restricted in size. Such courses will be labelled 'restricted enrolment' courses in the timetable. If such a course is found to be oversubscribed, students whose programs do not require that course may be required to delete it from their registration.

42.4 Credit by Special Assessment

A student admitted to a degree program in the Faculty of Arts, may receive degree credit in a limited number of courses for knowledge or skill obtained in a non-university context or by private study. "Non-university context" may include work completed at institutions not accredited for degree purposes or may refer to periods of work experience that bear rela-

tionship to university courses. The following conditions apply:

(1) *Non-university context:* a student may apply for credit on this basis, following admission to a degree program.

(2) *Private study:* a student who has been admitted to a degree program and has successfully completed at least one academic year of work (four or five full-course equivalents) may apply for credit on this basis.

(3) *Number of courses allowed:* Normally only two full-course equivalents obtained by special assessment may be applied to a degree program in the Faculty of Arts. In exceptional circumstances on the recommendation of a department chairman, the Dean may permit additional credits by special assessment.

(4) *Limitations:*

(a) A student seeking credit in a prerequisite to a course in which advanced placement has been given, must make application for credit by special assessment no later than the last day for course registration in the term in which the advanced course is being taken and must complete the requirements for assessment within the prescribed three months.

(b) Except under the special circumstances specified in (3) above, a student is restricted in the number of attempts to obtain credit by special assessment to a maximum of two full-course equivalents.

NOTE: This limits the number of courses that may be challenged, regardless of results.

(5) *Timing of assessments (deadlines):* The deadline for completion of the examination or assessment, is three months from the date of application for credit by special assessment. Unless there are extenuating circumstances, a student who fails to complete assessment requirements by the specified deadline, will be considered to have cancelled his/her application and will have to re-apply should he/she wish to complete that assessment. [see (4) above]

(6) *Courses not accepted:* Graduate courses and Honors courses (i.e., those open only to Honors students and specified as such in the calendar) and normally, "100 level" courses and courses previously audited, cannot be attempted by Special Assessment.

(7) *Transfer of "credit by special assessment":* A student who has obtained credits by special assessment (or similar means) while enrolled in another university, college, faculty or school, will be given advance credit in such courses only to the extent that the Faculty of Arts accepts such courses in its degree programs. [see also (3) above]

(8) *Grades assigned to special assessment courses:* The results in a course attempted by special assessment, will be recorded either as a grade point or as a pass/fail at the discretion of the department giving the test. A student may not appeal the results in a course attempted by special assessement.

(9) *Failure:* A course attempted by special assessment and failed, will be recorded on the transcript of the student concerned and will be computed into his or her academic record.

(10) *Expunging a failed grade from the record:* A failed grade in a course attempted by special assessment, may be expunged from a student's record, when this is applicable, if that student subsequently takes and passes that course in the normal manner.

(11) *Fee:* A fee of $75.00 per single-term or full-session course will be assessed and must be paid before the department concerned undertakes the special assessment. The amount of this fee is subject to change.

42.5 *Academic Standings and Graduation*

(1) *Categories of Academic Standing.* There are three categories of academic standing, designated as categories (A), (B), and (C). These categories are determined for each student by the computation of a Quality Index upon the completion of each year of study. The Quality Index (Q.I.) is defined by the following formula:

$$\text{Q.I.} = \frac{\text{Number of Courses Passed}}{\text{Number of Courses Attempted}} \times \text{G.P.A.}$$

In the above formula, G.P.A. (Grade Point Average) is the sum of the products of all grades and their respective course weights divided by the sum of those weights.

The categories of standing are as follows:

Category A: All students with a Q.I. of 4.0 or greater.

Category B: All students with a Q.I. of less than 4.0 but greater than 2.0. Performance in this Q.I. range is considered to be "unsatisfactory."

Category C: All students with a Q.I. of 2.0 or less. Performance at this level is considered to be "extremely unsatisfactory."

(2) *Continuation in Programs and Graduation.* Students who meet graduation requirements in their year's work in a program will normally be permitted to continue in that program. These requirements vary from program to program. The section below that deals with the particular program of concern should be consulted for further details.

(3) *Requirement to Withdraw from the Faculty.* Students in Category "C" at the end of a year's work will be required to withdraw from the Faculty of Arts. Students in Category "B" will be permitted to continue, with a warning that a repetition of the unsatisfactory performance (Category "B") in a subsequent year will normally result in a requirement to withdraw from the Faculty.

When a student has been required to withdraw, normally at least a year must elapse before readmission will be granted. All applications for readmission after a requirement to withdraw must be accompanied by a recommendation from Student Counselling Services. Students who have been required to withdraw more than once from another faculty, will normally not be admitted to the Faculty of Arts until they have successfully completed a full year of academic studies in another faculty, college or university.

(4) *Probation.* Students who are readmitted after being required to withdraw must demonstrate ability to meet graduation standards. They must normally register as full-time students (with a minimum of four full-session courses); achieve a grade point average of 5.0 with a five-course registration, or 5.5 with a four-course registration, before supplementals; and pass all courses with a minimum grade of 4.0 after supplementals. Supplementals for this purpose will be permitted in no more than one full-session course or two single-term courses.

Upon successful completion of these requirements probation will be lifted. Failure to meet these standards will result in a further requirement to withdraw.

Upon readmission the student's record will be

assessed for credits. All courses taken and passed in prior successful years will be credited toward the degree. However, only those courses in which a grade of five (5) or better was achieved will be given credit from the unsatisfactory year that necessitated the student's withdrawal.

The privilege of repeating a year will be granted to a student not more than once during his/her candidacy for a degree in this Faculty, unless by special permission of the Dean.

(5) *Appeals.* A student may appeal against any ruling of the Faculty of Arts.

Students who wish to appeal a ruling affecting their academic standing, other than admission and grades in individual courses, should direct their appeal in the first instance to the Associate Dean for Student Programs and Curriculum. Recourse is then available to the Faculty of Arts Executive Committee and the General Faculties Council Academic Appeals Committee, in that order. Further information on such appeals is available in § 16.7 of the University Regulations and Information for Students Calendar.

Appeals regarding the student's standing in a particular course should first be directed to the instructor concerned. Frequently the issue can be resolved at this level. However, further recourse is available through the Chairman of the Department in which the course is being offered. See § 16.3.3(2) of the University Regulations and Information for Students Calendar for reappraisal deadlines.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Arts, and are therefore given, together with the details of the program to which they apply, in § 43 below. Regulations for the B.A., the B.F.A. and the B.Mus. degrees will be found in § 43.1

For regulations concerning First-Class Standing and the degree of B.A. with Distinction see § 16.4.1 and 16.4.3 respectively of the University Regulations and Information for students calendar.

43 PROGRAMS OF STUDY

43.1 The Degrees of B.A., B.F.A. and B.Mus.

43.1.1 THE DEGREE OF B.A. WITH HONORS

Programs leading to the degree of Bachelor of Arts with Honors require a minimum of twenty full-session courses or their equivalent. Normally, these programs will be completed in four consecutive years of study during Winter Sessions. They are designed to provide specialization in the chosen subject or subjects, with study in greater depth than is provided by the General program, and demand a higher standard of performance. A Combined Honors program involving two subjects of concentration may also be considered through consultation with the departments concerned.

Admission. Most departments do not provide a special first year for students who wish to read for Honors. Permission to enter first-year Honors is granted to students with high matriculation standing and with the approval of the department concerned. A request for this privilege should be made on the "Application for Admission" form.

Students need not commit themselves to Honors in their first year, and may register in an appropriate selection of courses as required by the regulations of a General program. If they obtain a sufficiently high standard in their first year and are recommended by the department concerned, they may enter Honors in their second year.

Some departments will consider applications for transfer to Honors submitted by students who have completed the second or even third year of another program.

Selection of courses. The following regulations govern Honors programs:

(1) In each year, an Honors student's program must be approved by the chairman of his/her department and by the Dean.

(2) Each student's program must include English 200 or its equivalent and an approved laboratory science course. (See 42.3(1)(a).)

(3) No student may include more than seven full junior courses or their equivalent in the program, except by special permission of the Dean.

(4) Students are not permitted to confine their studies to one discipline; during their first three years they must take at least three courses not closely related to their subject of specialization, i.e., students specializing in a subject administratively classified as a "Humanity" must take at least three courses classified as "Fine Arts," "Social Sciences" or "Natural Sciences"; students specializing in a subject administratively classified as a "Social Science" must take at least three courses classified as "Fine Arts," "Humanities" or "Natural Sciences"; students specializing in a subject administratively classified as "Fine Arts" must take at least three courses classified as "Humanities", "Social Sciences" or "Natural Sciences". Students should consult their Honors advisor.

(5) Over the four years the student will be required to take not fewer than eight courses in the subject of concentration as defined by the department; for Combined Honors programs, the minimum number of courses in each discipline will be decided through consultation with the department concerned but in no case will it consist of less than six courses in each departmental program.

Academic standings and graduation. The following regulations govern Honors programs:

(1) Admission to Honors by re-enrolment, and promotion from one year to another is by recommendation of the department concerned, whose required grade-point average may exceed the Faculty minimum of 6.5. The student's grade point average for admission to an Honors program must be based on a minimum four courses taken during the student's most recent year in full-time attendance.

(2) A student who fails to attain the standard necessary for continuance in Honors at the end of the first or second year must withdraw from Honors. Such students may transfer to another program in the Faculty provided they meet the requirements for that program. After such transfer they must complete all requirements for their new program. The special first-year Honors programs are so designed that a student can normally proceed to a degree in a four-year program or in the General program without penalty.

(3) Students who are not recommended to continue in Honors at the end of their third year, or who fail to complete the requirements for a degree with Honors in their fourth year, may be granted the General degree forthwith, provided that their program includes either (1) one course from each of the Fine Arts, Humanities, and Social Sciences offerings, plus an approved laboratory course in the Natural Sciences (see § 42.3(1)), or (2) a second area of concentration comprised of not less than three courses in a particular discipline, and otherwise meets the requirements of the General program. A student deficient in any respect may be required to take one or more courses in a subsequent session.

(4) A student who, for any reason, is unable to return to university for the fourth year may apply for a General degree under the same conditions as one who has failed to meet the required standards.

(5) Students who are not recommended for graduation with Honors at the end of their fourth year may be granted the B.A. (Special) degree forthwith, provided they have successfully completed twenty courses which include either (1) one approved laboratory science course and a second subject of concentration consisting of four or five courses; or (2) one course from each of the Fine Arts, Humanities, and Social Sciences offerings, plus an approved laboratory course in the Natural Sciences (see § 42.3(1), and a second subject of concentration consisting of three courses (in all cases full-year or their equivalent). In no case will students be permitted more than ten courses in their principal subject of concentration. A student deficient in any respect may be required to take one or more courses in a subsequent session.

(6) A reduced course load (less than five full-session courses) in any year of an Honors program, or interruption of such a program, must be approved by the Honors Committee of the Faculty.

(7) Degrees with Honors are awarded in two classes: First Class Honors and Honors. Required grade-point averages for each class are recommended by the departments on the basis of selected courses and may exceed the Faculty minimum of 8.0 and 6.5.

43.1.2 THE DEGREE OF B.A. (GENERAL)

NOTE: The word 'course' used in the following context refers to a full-session course or equivalent (two single-term courses).

(1) The B.A. (General) program is designed to enable a student to obtain a diversified education in more than one branch of study, within the limits of a three-year program. A student must secure credit in at least eight Arts courses.

(a) *Duration:* A fifteen-course program normally taken in three years. This period may be extended at the student's discretion. Acceleration of the program will only be permitted in exceptional circumstances and with the Dean's approval.

(b) *Language requirement:* Candidates for the B.A. (General) must present credit in a language other than English, either at the senior matriculation level or at university level. In the event of a matriculation deficiency, the language course must be taken in the first year (§ 42.1).

(c) *Residence requirement:* A student proceeding towards the B.A. (General) degree must have credit for at least five full-year (or equivalent) University of Alberta courses. These shall normally be the final five courses in the student's program. A student who has fulfilled the five-course requirement before the beginning of the final year of the program may apply to the Dean for permission to take one or more of the final five courses elsewhere.

(2) *Curriculum:*

(a) *First Year:* Five junior courses are required; no more than one course may be selected from each discipline.

(b) *Compulsory Course Requirements:* One full-course equivalent is required from each of the following four areas: Laboratory Science, Fine Arts, Humanities, and Social Sciences (for classification of courses see § 42.3). Mandatory First-Year requirements include a junior English course, a language other than English (where a language deficiency exists, para. (1) b above) and normally, an approved laboratory science course (§ 42.3 para. (1) a)

NOTE 1. If a junior laboratory science course is not taken, there are a number of senior laboratory science courses available, but most have prerequisites.

NOTE 2. The required junior English course does not satisfy the "Humanities" requirement.

NOTE 3. Students who entered the B.A. program prior to September 1979, may continue under the program requirements then in effect (§ 43.1.2 of the 1978/79 Arts & Science calendar); those who interrupt their program for a period of more than two years, will be required to meet the new requirements.

(c) *Subjects of concentration:* Two are required: a principal subject chosen from the Fine Arts, Humanities, Social Sciences or Mathematics, and a second subject, which may be chosen from the offerings of either the Faculty of Arts or the Faculty of Science. In the principal subject, a minimum of three courses is required, at least two of which must be senior courses; a maximum of five courses is permitted. If a combination of Mathematics/Statistics is chosen, a minimum of four courses is required, two at the senior level. In the second subject, a minimum of three courses is required and a maximum of four courses is permitted. The following science combinations are permissible but require a minimum of four courses, two of which must be at the senior level: Mathematics / Statistics; Biology / Zoology / Microbiology / Entomology / Botany / Genetics; Astronomy / Physics; Chemistry / Biochemistry; Geography / Cartography / Meteorology.

(d) *Course Selection:* Courses offered in the departments and/or subjects listed below will be accepted by the Faculty of Arts as a subject of concentration provided that the requirements stated in the preceding paragraph and the course prerequisite requirements are fulfilled:

Anthropology, Art, Chinese, Classics (Ancient History, Art, Classical Literature in Translation), Greek, Latin, Comparative Literature, Drama, Economics, English, Geography, Germanic Languages (German, Scandinavian), History, Japanese, Linguistics, Mathematics, Music, Philosophy, Political Science, Psychology, Religious Studies, Romance Languages (French and/or French-Canadian, Italian, Spanish, Romance Linguistics), Slavic Languages (Polish, Russian, Slavics, Ukrainian), Sociology. For additional information and advice consult the "Programs of Study" section of the respective departments (§ 43.2-43.23).

(e) *Limitations:* No more than four courses may be

taken for credit in a subject other than the subjects of concentration.

(f) *Junior courses:* Normally, no more than seven courses at the '100' or '200' level may be taken for degree credit. In no case will this limit be extended to permit a student to make up a matriculation deficiency for degree credit, or to include a 'free' option at the junior level.

(g) *Free options:* After completion of all first-year requirements, a student may include two courses chosen from outside the Faculties of Arts and Science in his/her program subject to the conditions stated in § 42.(3)2. In exceptional circumstances a third such course may be taken.

(h) *Academic performance:* To qualify for a B.A. (General) degree a student must present a grade of 4 or better in a minimum of fourteen courses, not less than a grade of 3 in a fifteenth course (provided this is not a course in either subject of concentration), and a grade point average of at least 5.0 in all courses credited to the degree after the completion of first-year requirements.

(i) *Supplemental examinations:* No more than five may be written during the program. No more than two may be written in any academic year, whether for the purpose of obtaining passing marks or of raising the ten courses GPA to the required 5.0. Supplemental examinations will not be granted in any course where the weight of the final examination is less than 40%.

43.1.3 THE DEGREE OF B.A. (SPECIAL)

NOTE: The word 'course' used in the following context refers to a full-session course or equivalent (two single-term courses).

(1) The B.A. (Special) program is designed to enable students, under the guidance of the department of their choice, to obtain a diversified education in more than one branch of study, but with a greater degree of specialization in a particular field than is available in the General program. A student must secure credit in at least eleven Arts courses. Every registration or change of registration must bear the signature of the departmental advisor concerned indicating the approval of the department.

(a) *Duration:* A twenty-course program normally taken in four years (five courses per year).

(b) *Language requirement:* Same as B.A. (General).

(c) *Residence requirement:*

(i) A student proceeding towards the B.A. (Special) degree in the Faculty of Arts must have credit for at least ten full-year (or equivalent) University of Alberta courses.

(ii) When enrolled in the B.A. (Special) program the student shall normally take five full-year courses (or equivalent) during each regular academic year. The student's department may recommend to the Dean exemption from this regulation.

(iii) The final year of the B.A. (Special) program must be taken in one regular academic year in attendance at the University of Alberta campus. The student's department may recommend to the Dean exemption from this regulation. A student who has fulfilled the ten-course requirement prior to the beginning of the final year of the program may apply to the Dean for permission to take one or more of the final five courses elsewhere.

(2) *Curriculum:*

(a) *First Year:* Same as B.A. (General).

(b) *Compulsory course requirements:* Same as B.A. (General) § 43.1.2(2)b above.

(c) *Subjects of concentration:* Two are required; a principal subject chosen from the Fine Arts, Humanities, Social Sciences or Mathematics and a second subject which may be chosen from the offerings of either the Faculty of Arts or Faculty of Science. In the principal subject a minimum of five courses is required, at least four of which must be senior courses; a maximum of eight courses is permitted. In the second subject a minimum of four courses is required and a maximum of five permitted. For acceptable combinations of science courses see B.A. (General), § 43.1.2(2)c.

(d) *Course Selection:* Courses offered by departments will be accepted by the Faculty of Arts as a subject of concentration provided that the requirements stated in the preceding paragraph and the course prerequisite requirements are fulfilled and departmental approval has been secured. For additional information and advice consult the "Programs of Study" section of the respective departments (§ § 43.2-43.23).

(e) *Limitations:* Same as B.A. (General) § 43.1.2(2)e above.

(f) *Junior courses:* Same as B.A. (General) § 43.1.2(2)f above.

(g) *Free options:* (§ 42.3(2)). After completion of first-year requirements, a student, with the recommendation of his or her department and the consent of the Dean, may include two courses chosen from outside the Faculties of Arts or Science in the program, subject to the conditions stated in § 42.3(2). In exceptional circumstances a third such course may be taken. See Faculty of Arts Program office for the list of courses not open to Arts students.

(h) *Academic performance:* To qualify for a B.A. (Special) a student must present a grade of 4 or better in a minimum of nineteen courses, no less than 3 in a twentieth course (provided this is not a course in either subject of concentration), and a grade point average of at least 5.0 in the last ten courses of the program.

(i) *Supplemental examinations:* Same as B.A. (General), § 43.1.2(2)(i) above.

43.1.4 THE DEGREE OF B.A. (SPECIAL) IN EAST ASIAN STUDIES

This is a four-year (twenty full-session courses) program under the B.A. (Special) degree category (see § 43.1.3). It differs in that the student is required to have three subjects of concentration: East Asian Studies (eight full-session courses), a second discipline (five to eight full-session courses), and a third discipline (three to five full-session courses). Overlap is, however, permitted between East Asian Studies and the second or third concentration. In addition, at least two years of an East Asian language is required. Guidance in the selection of courses is provided by the Chairman, East Asian Studies, c/o Department of History.

43.1.5 CERTIFICATE OF EQUIVALENCE

Applicants holding a University of Alberta B.A. (General) degree may qualify for a certificate indicating that they have met the requirements of the B.A. (Special) or B.A. (Canadian Studies) degree by completing five further courses, or more, if required, to meet curriculum requirements. This option is not open to degree holders from other universities.

§ § 43.2 to 43.23 contain advice offered by the various Arts departments for students selecting courses in their subjects of concentration. Further information may be obtained by consulting members of the department concerned.

43.1.6. THE DEGREE OF B.A. (CANADIAN STUDIES)

NOTE: The word "course" referred to in the following context refers to a full-session course or equivalent (two single-term courses).

This is a four-year (twenty course) program, selected under the guidance of the chairman (or designate) of the Committee on Canadian Studies.

Conditions governing graduation, supplemental examinations, course load, final year and residence requirements are as for the B.A. (Special) program. (§ 43.1.3)

(1) *Canadian Studies Course Requirements:* A minimum of at least eight courses with Canadian content is required including at least three CANST courses and five courses from the list of approved Canadian Studies courses, three of which must be Canadian government, Canadian history, and Canadian literature.

(2) *Specialization Requirements:* Specialization may be within an established discipline (e.g., English) or across two disciplines (e.g., Economics and Political Science) or by special arrangement whereby individual students may propose specializations of a multidisciplinary nature, normally drawn from the list of approved Canadian studies courses. In a regular program, at least five courses are required and no more than eight courses are permitted, at least three of these must be approved Canadian studies courses. In the case of a combined specialization, four courses in each discipline are required and at least three of the eight must be approved Canadian studies courses.

A student specializing within the Humanities must complete at least three courses in the Social Sciences, and vice versa.

Students are required to demonstrate a reading knowledge of French by passing a French reading proficiency examination, normally by the end of the second year of studies. Students are also required to take one approved "200 level" English course, one approved laboratory science course, and one Fine Arts course.

(3) *Extra-Faculty Options:* One extra-faculty course selected from the list of approved Canadian studies courses, may count towards the Canadian studies requirement. (§ 43.1.3).

For the certificate of equivalence see § 43.1.5.

43.1.7 THE B.A. (HONORS) AFTER ANOTHER UNDERGRADUATE DEGREE

Requirements of a B.A. (Honors) degree after another undergraduate degree will vary depending on the previous degree held and the Honors degree sought. In all cases, minimum admission and promotion requirements of the Honors degree must be met (see § 43.1.1), and departmental recommendation and Faculty approval for admission must be secured. For detailed information, applicants should contact the Departmental Honors Advisor concerned and the Faculty of Arts Student Program Office.

43.1.8 THE B.A. (GENERAL) AFTER A THREE-YEAR BACHELOR'S DEGREE (OTHER THAN BACHELOR OF ARTS)

Holders of a recognized three-year Bachelor's degree, other than a Bachelor of Arts, whose programs for the first degree included at least six Arts and Science courses, may qualify for the B.A. General degree by completing nine Arts and Science courses as prescribed by the Faculty of Arts. Those with fewer than six Arts and Science courses will be required to take additional courses.

Students in this program must meet, in their six transfer courses and their nine additional courses, the requirements for the B.A. General degree as stated in § 43.1.2 of the Arts and Science Calendar.

43.1.9 THE B.A. (GENERAL) AFTER A FOUR-YEAR BACHELOR'S DEGREE (OTHER THAN BACHELOR OF ARTS)

Holders of a recognized four-year Bachelor's degree, other than a Bachelor of Arts, whose programs for the first degree included at least eight Arts and Science courses, may qualify for the B.A. General degree by completing seven Arts and Science courses as prescribed by the Faculty of Arts. Those with fewer than eight Arts and Science courses will be required to take additional courses.

Students in this program must meet, in their eight transfer courses and their seven additional courses, the requirements for the B.A. General degree as stated in § 43.1.2 of the Arts and Science Calendar.

Requirements applicable to both of the programs listed above:

(1) A principal subject of concentration in an Arts subject. This may be the same subject as the principal subject of concentration in the first degree.

(2) A second subject of concentration. This may be either an Arts or a Science subject.

(3) One full-course equivalent is required from each of the following areas: Laboratory Science, Fine Arts, Humanities, Social Sciences (for classification of courses see § 42.3 para. 1 of the Arts & Science calendar).

NOTE: The required junior English course does not satisfy the "Humanities" requirement. Students who entered the B.A. program prior to September 1979 may continue under the program requirements then in effect. Those who interrupt the program for a period of more than two years will be required to conform to the new requirements.

(4) English 200 or its equivalent.

(5) A maximum of seven junior courses in the total program (including both transfer courses and courses taken in the Faculties of Arts and Science). However, the Dean may approve up to two and, in rare cases, three extra junior courses if, in his/her judgment, these are deemed essential in establishing the new program.

Notes applicable to both programs listed above:

(1) These regulations apply only to the holder of a Bachelor's degree, or its equivalent.

(2) The extra-Faculty free options open to students in the regular B.A. programs are not available in the "B.A. after" programs.

(3) A student taking a B.A. after a B.Sc. degree will not normally be permitted to take further courses in the Faculty of Science.

(4) The B.A. (Special) after another three or four-year baccalaureate degree, requires an additional

year of study (five full-session courses) beyond the requirements for the General degree. These courses will be taken under the direction of the department in which the principal subject of concentration is taken. All requirements for the B.A. (Special) as stated in § 43.1.3 must be met.

NOTE: Students seeking a third Bachelor's degree will be required to complete the full course requirements for that degree.

43.1.10 THE B.F.A. OR B.MUS. AFTER A PREVIOUS BACHELOR'S DEGREE

The requirement for a B.F.A. (Art and Design) or a B.F.A. (Drama) or B.Mus. after a previous Bachelor's degree, will normally be three years, (fifteen full-session courses or equivalent), but in no case will less than twelve full courses or equivalent be required. The program will be established by the Faculty of Arts.

43.1.11 THE DEGREE OF B.F.A. IN ART AND DESIGN

The Department of Art and Design offers a program leading to the degree of Bachelor of Fine Arts in Art and Design. The program is as follows:

First year: Art History 201/202; Art 232, 233, 240; English 200 or equivalent; an approved First Term Arts or Science option.

Second year: One full-course equivalent chosen from Art History courses at the 300 or 400 level. Art 340, plus three studio art courses from the 300 level and one approved Arts or Science option.

Third year: A senior Art History course plus three studio art courses from the 400 or 500 level; and one approved senior Arts or Science option.

Fourth year: One full-course equivalent chosen from Art History courses at the 400 or 500 level, plus three senior studio art courses including a minimum of two at the 500 level and one approved senior Arts or Science option.

The program is subject to the following regulations:

(1) *Admission requirements* are as set out in § § 13.1 and 13.4.2 of the University Regulations and Information for Students Calendar.

(2) *Promotion:*

(a) Promotion in all years is by recommendation of the Department for which a grade point average of at least 5.5 is normally required. One grade of 3 in a full-session course or equivalent may be accepted, provided it is not in the central subject of the program.

(b) A grade of 4 in a central subject may normally be allowed only once in a B.F.A. student's program. Any subsequent course in which a grade of 4 is received must be repeated for B.F.A. credit, or an alternative course, approved by the Department, must be substituted.

(c) To qualify for the Bachelor of Fine Arts in Art and Design a student must have successfully completed twenty and one-half full-course equivalents; of these, twelve must be studio courses, two of which must be at the 500 level.

(d) A student who is not recommended to continue in the program at the end of the first, second or third year of study must withdraw from the program. Such a student may transfer to another program in the Faculty of Arts provided the entrance and promotion requirements for such a program are met. After transfer all requirements for the new program must be completed.

(e) A Bachelor of Fine Arts program may be interrupted only with the consent of the Department.

(3) *B.F.A. Art and Design degree:*

(a) A student proceeding towards the B.F.A. Art and Design degree must have credit in at least ten full-session or equivalent University of Alberta courses.

(b) When enrolled in the B.F.A. Art and Design program, the student shall normally take a full course load as specified by the program during each regular academic year. The Department may recommend to the Dean exemption from this regulation.

(c) The final year of the program must be taken in one regular academic year in attendance at The University of Alberta campus. The Department may recommend to the Dean exemption from this regulation.

For the degree of B.F.A. with Distinction see § 16.4.3 of the University Regulations and Information for Students Calendar.

43.1.12 THE DEGREE OF B.F.A. IN DRAMA

43.1.12.1 GENERAL INFORMATION

The Department of Drama offers a program leading to the degree of Bachelor of Fine Arts. Students are required to specialize in either Acting or Design. Courses in the program are listed below. The program is subject to the following regulations:

(1) Admission requirements are as set out in § § 13.1 and 13.4.3 of the University Regulations and Information for Students Calendar.

(2) A non-refundable deposit towards tuition fees, will be required of successful applicants, on official notification of acceptance. (See § 13.1.2 of University Regulations and Information for Students Calendar.)

(3) To be granted the B.F.A. degree, a student must comply with the following regulations.

(a) To be promoted in each year, a student will normally be required to have a grade point average of 5.5 plus the recommendation of the Department. One grade of 3 in a full session course or equivalent may be accepted in the program provided it is not in the central subject (i.e. Drama).

(b) A student who is not recommended to continue in the program at the end of the first, second or third year of study must withdraw from the program. Such a student may transfer to another program in the Faculty of Arts provided the entrance and promotion requirements for such a program are met. After transfer all requirements for the new program must be completed.

(c) A student who fails to meet the fourth year requirements in the program will be permitted to fulfill those requirements only with the approval of the department and the Dean of Arts.

(d) A Bachelor of Fine Arts program may be interrupted only with the consent of the Department.

(e) A student must complete the first and final years in full attendance at The University of Alberta. The final year must be taken in one regular academic year. The Department may recommend to the Dean exemption from this regulation.

43.1.12.2 SPECIALIZATION IN ACTING

First year: Drama 200, 230, 240, 254, 255, 257, 270, 271; English 200 or equivalent.

Second year: Drama 300, 330, 335, 340, 345, 350, 351, 355; an approved non-Drama Arts or Science Option.

Third year: Drama 383, 401 or 402, 430, 435, 441, 445, 450, 455; English 333 and an approved single-term non-Drama Arts or Science option (or English 332); an approved single-term option.

Fourth year: Drama 530, 535, 541, 545, 551, 592, 595.

43.1.12.3 SPECIALIZATION IN DESIGN

First year: Drama 200, 251, 270, 271, 272, 293; English 200 or equivalent.

Second year: Drama 300, 353, 370, 372, 375 *or* Clothing and Textiles 403 *and* Clothing and Textiles 304, Drama 395; an approved non-Drama Arts or Science option.

Third year: Drama 383, 385, 401 or 402, 470, 472, 493, 351 or 551; an approved Art option.

Fourth year: Drama 509 (or 507), 570, 575, 593, 595; Philosophy 350/351 or Art or Music option.

For the degree of B.F.A. with Distinction see § 16.4.3 of the University Regulations and Information for Students Calendar.

43.1.13 THE DEGREE OF B.MUS.

43.1.13.1 GENERAL INFORMATION

The Department of Music offers a variety of four-year programs leading to the degree of Bachelor of Music. Candidates for the B.Mus. degree may choose one of four areas of study: 1) Applied Music (Keyboard, Orchestral Instrument, or Voice); 2) Composition; 3) Music History and Literature; 4) Music Theory. All Bachelor of Music students are required to participate for at least two years in an approved large ensemble such as a band, choir or orchestra. The course requirements for each of these programs are set out below.

The programs are subject to the following regulations:

(1) Admission requirements are as set out in § § 13.1 and 13.4.4 of the University Regulations and Information for Students Calendar.

(2) To be granted the B.Mus. degree, a student must comply with the following regulations:

(a) To be promoted in each year, a student will normally be required to have a grade point average of 5.5 in the program plus the recommendation of the Department. One grade of 3 in a full-session course or equivalent may be accepted in the program provided it is not in the central subject.

(b) A student who is not recommended to continue in the program at the end of the first, second or third year of study must withdraw from the program. Such a student may transfer to another program in the Faculty of Arts provided the entrance and promotion requirements for such a program are met. After transfer all requirements for the new program must be completed.

(c) A student who fails to meet the fourth-year requirements in the program, will be permitted to fulfill those requirements only with the approval of the Department and the Dean of Arts.

(d) A B.Mus. program may be interrupted only with the consent of the Department.

(e) A student proceeding toward the B.Mus. degree will normally have credit in at least ten full-session or equivalent University of Alberta courses. Note: U. of A. courses include off-campus, Evening Credit Program, Spring Session or Summer Session courses.

(f) When enrolled in the B.Mus. program, the student will normally take five full-session or equivalent courses during each regular academic year. The Department may recommend to the Dean exemption from this regulation.

(g) The final year of the program will normally be taken in one regular academic year in attendance at the University of Alberta campus. The Department may recommend to the Dean exemption from this regulation.

(3) Each candidate, except in Applied Music (Voice), must complete a course in one of Latin, Italian, French, German, or Russian as one of his or her options.

(4) Options must be approved by the Department.

(5) Candidates other than those who elect a keyboard instrument as a first practical subject are required to pass a keyboard proficiency examination prior to completion of the program. Music 222, 322, 422, and 522 (second practical subject) are available as music options and may be used to prepare for keyboard proficiency tests.

(6) A candidate in Applied Music (Orchestral Instruments) may choose to study any one of the following as the First Practical Subject: violin, viola, cello, double bass, flute, oboe, clarinet, saxophone, bassoon, trumpet, French horn, trombone, tuba, harp, percussion.

(7) A candidate in Applied Music (Keyboard) may choose to study harpsichord, organ, or piano as the First Practical Subject.

(8) Candidates in Applied Music will be required to present a junior and a senior recital before graduation.

(9) New first-year students are admitted to a Common First Year as outlined below. Routes of concentration for the remaining three years of the program are designated in consultation with the Department at the end of the first year.

43.1.13.2 COMMON FIRST YEAR

Music 202, 203, 223 or 225, 250, 251; single-term option; a single-term non-music option; English 200, 210 or two junior single-term courses in English.

43.1.13.3 COMPOSITION

Second year: Music 301, 304, 324, 350, 351, 360, 361, language option.

Third year: Music 352, 402, 424, 460, 462, 463, 544, 580.

Fourth year: Music 437, 560, 581; non-music option, single-term non-music option, single-term music history option, senior option.

43.1.13.4 HISTORY AND LITERATURE

Second year: Music 301, 304, 324, 350, 351; non-music option; single-term music option; language option.

Third year: Music 361, 402, single-term music history option; single-term music option; single-term non-music option, Music 352, 424; language option.

Fourth year: Music 437, 438, 501, 502, music history option, music option; senior option.

43.1.13.5 THEORY

Second year: Music 301, 304, 324, 350, 351, 360, single-term music option, non-music option.

Third year: Music 352, 361, 402, 424, 462, 463, 544; language option.

Fourth year: Music 437, 438, 545, 580, senior option, single-term music history option, single-term non-music option, music option.

43.1.13.6 APPLIED MUSIC, KEYBOARD

A specialization in chamber music, pedagogy, solo performance, or vocal accompanying/coaching will be chosen at the end of the second year in consultation with the Department.

Candidates specializing in vocal accompanying/coaching must attend no less than one hour per week of Music 430/530 in the third and fourth years, and are encouraged to take a course in two of the following languages: French, German, Italian.

Candidates specializing in organ are not required to enrol in Music 428, 429, 528, 529, but are required to complete Music 427 and 531.

Second year: Music 301, 304, 325, 350, 351, music option, full-session course or equivalent, language option.

Third year: Music 352, 361, 402, 403 and 404 or 406, 425 or 465, 428 (required in vocal accompanying specialization) or 429 (required in chamber music specialization), single-term non-music option.

Fourth year: Music 503 and 504 or 533 and 534, 525 or 565, one of 528 (required in vocal accompanying specialization), 529 (required in chamber music specialization) or 531, single-term music option, non-music option, senior option.

43.1.13.7 APPLIED MUSIC, ORCHESTRAL INSTRUMENTS

A general woodwind specialization may be arranged in consultation with the Department.

Second year: Music 301, 304, 323, 329, 350, 351; single-term music option; language option.

Third year: Music 352, 361, 402, 423, 429, 457/458 or music option (to be selected from appropriate instrumental techniques courses), single-term non-music option.

Fourth year: Music 523, 529, 557/558 or music option, single-term music option, non-music option, senior option.

43.1.13.8 APPLIED MUSIC, VOICE

Second year: Music 301, 304, 325, 350, 351, 361; single-term music option; Italian*.

Third year: Music 352, 402, 425, 430, 435/436 or 455/456; German*.

Fourth year: Music 525, 530, 535/536 or 555/556, single-term music option, senior option, French*.

*'Reading' courses not acceptable.

43.1.14 TRANSFER WITHIN THE FACULTY OF ARTS

A student may transfer from one program to another within the Faculty of Arts at the beginning of the regular academic session provided the entrance requirements for the proposed program are met. After transfer the student must meet all requirements for graduation in the new program. For further details see the sections dealing with each program.

43.1.15 OPTIONS

The term "option", where it appears in the following programs, means an Arts or Science course freely chosen by the student provided he/she has the necessary prerequisites. An approved option in Honors, B.F.A., B.Mus., and B.A. (Special) programs is an option approved by the department directing the program of the student concerned.

43.2 Anthropology

43.2.1 HONORS IN ANTHROPOLOGY

The B.A. with Honors is designed to provide both broad training in Anthropology and an opportunity to undertake independent work. Interested students may obtain information regarding the program from the departmental office.

43.2.2 CONCENTRATION IN ANTHROPOLOGY

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department advises the following sequences.

Three-course sequence. Either Anthropology 202 or 306 and 307; 308, 309 or a regional ethnology course; one 400-level course.

Four-course sequence: Either Anthropology 202 or 306 and 307; 308 and 309; a regional ethnology course; one 400 level course.

Five-course sequence: Either Anthropology 202 or 306 and 307; 308 and 309; a regional ethnology course and two senior courses in the subdiscipline or area of specialization.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.3 Art and Design

43.3.1 HONORS IN HISTORY OF ART AND DESIGN

An undergraduate may elect to read for Honors in History of Art and Design either at the beginning of the first year or after satisfactory completion of one or two years of the general B.A. program. In any case, he/she must consult with the Chairman of the Department before being admitted to the Honors program. The degree of B.A. with Honors in History of Art and Design is awarded after satisfactory completion of an Honors essay, proof of the candidate's ability to read a modern language other than English (usually French, German or Italian), and the attainment of a satisfactory standard in all aspects of the program.

First year: English 200 or equivalent; a language other than English (usually French, German or Italian); an approved laboratory science course; ART H 201/202; ART 231 or one approved full course equivalent Arts or Science option.

Second Year: A language other than English (usually French, German, or Italian); ART H 305/355, 306/356, and ART H 304/354 or 307/357; one approved full course equivalent Arts or Science option.

Third year: One full course ART H 459 or an approved equivalent; two approved full course equivalent ART H options from the 400 and 300 levels; two approved full course equivalent senior Arts or Science options.

Fourth year: One full course ART H 559; two approved full course equivalent ART H options chosen from the 500 and 400 levels; two senior full course equivalent Arts or Science options of which one may be a further senior course in the History of Art and Design.

The subject for the Honors essay should be selected in consultation with the Department by the end of the

third year. The essay will be written in the final year under the individual supervision of a member of the department, with whom the candidate will confer regularly. The Department may require any candidate for Honors, in addition to submitting the essay, to pass an oral or written examination on the subject of the essay.

43.3.2 CONCENTRATION IN ART AND DESIGN

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

For the degree of B.F.A. in Art and Design; see § 43.1.11.

43.4 Asian Studies (East Asian)

Department of History

43.4.1 THE DEGREE OF B.A. (SPECIAL) IN EAST ASIAN STUDIES

See § 43.1.4.

43.4.2 CONCENTRATION IN CHINESE

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.4.3 CONCENTRATION IN JAPANESE

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.5 Classics

43.5.1 HONORS PROGRAMS

The Department of Classics offers undergraduate programs leading to a B.A. with Honors in:

(1) Classics: normally 8-10 full-year courses in Greek and Latin and several related Classics courses.

(2) Classics, Ancient History and Classical Archaeology: similar to the above but with greater emphasis on ancient history and archaeology.

(3) Classics and Literature: similar to the second program, but with major emphasis on literature in translation.

(4) Latin or Greek with an approved second subject.

(5) Combined Honors (e.g., Latin and English, Latin and French, Greek and Philosophy).

Interested students are invited to consult the Honors Advisor or the Chairman of the Department for a personal interview.

NOTE: English 200 is recommended by the Department for students entering the first year of these programs.

43.5.2 CONCENTRATION IN CLASSICS

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) Both Greek and Latin may be started at University (Greek 100, Latin 100). The course for students who enter with high school Latin is Latin 200; the sequent course will be a senior course. Those beginning Latin in University (Latin 100) will in the second year take Latin 200 or 300, dependent on the standing attained in Latin 100. Greek 100 is followed by Greek 300. Three to five course sequences are available in Greek, Latin, or in Classics courses (Ancient History, Art, or Literature in Translation).

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.
(b) Five to eight course sequences in the subjects as listed in (1)b, above. Additional programs may be arranged in Greek Studies and Roman Studies.

43.6 Comparative Literature

43.6.1 HONORS IN COMPARATIVE LITERATURE

The Honors B.A. in Comparative Literature is designed to give the student a basic knowledge of international literary studies (history, theory, and criticism of literature) with a solid knowledge of at least one language and literature other than English (for native English speakers) or French (for native French speakers).

There are now three variations of this program:

(1) Four courses in Comparative Literature, six courses beyond the 100 level in one language and literature, five courses in another language and literature, and five approved options, for a total of twenty courses. Comparative Literature 201/202, English 200 or equivalent, another language, an approved laboratory science course, and an approved option, which may be a second language, must be included in the first year. Comparative Literature 351 and 352 must be included in the second or third year, and a Comparative Literature course on the relationships between the two chosen literatures in the fourth. The sequence of courses in the two languages and literatures should follow closely the usual pattern of Combined Honors programs in the respective departments.

NOTE: English and French may be taken as one or as both of the required languages and literatures.

(2) Six courses in Comparative Literature, six courses beyond the 100 level in one language and literature (other than English for native English speakers, and other than French for native French speakers), three courses in another language and literature, five approved options, for a total of twenty courses. Comparative Literature 201/202, English 200 or equivalent, another language, an approved laboratory science course, and an approved option, which may be a second language, must be included in the first year. Comparative Literature 351 and 352 must be included in the second or third year, and a Comparative Literature course on the relationships between the literatures in the two chosen languages, and Comparative Literature 500 in the fourth.

(3) Six courses in Comparative Literature, six courses beyond the 100 level in one language and literature (other than English for native English speakers, and other than French for native French speakers), three courses in another approved subject (such as Art, Drama, Linguistics, Music, Philosophy, etc.), and five approved options, for a total of twenty courses. The distribution of courses in Comparative Literature and the language and literature is the same as under (2), and for the three courses in another approved subject, the student should follow the advised three courses concentration sequence of the department concerned. Note: The Faculty requirement of a laboratory science course must be met.

NOTE: A student contemplating using his B.A. Honors in Comparative Literature as a basis for graduate studies in a language and literature should take as many approved options as possible in the latter.

Students wishing to read for Honors in Comparative Literature should consult the Department at the beginning of the first year. Students deciding, during or at the end of the first year, to undertake Honors in Comparative Literature, must consult the Department at the earliest possible moment in order to ascertain whether their first year courses and their standing in these course are acceptable as a basis for admission to Honors at the beginning of the second year, and in cases where the first-year courses do not seem to provide an adequate basis, to discuss what extra work should be taken to rectify the situation.

NOTE: Whenever necessary, Comparative Literature 301/302 will be considered as an equivalent of Comparative Literature 201/202 for a B.A. program with Honors in Comparative Literature.

43.6.2 CONCENTRATION IN COMPARATIVE LITERATURE

Language Requirement: It is strongly recommended to students in the B.A. (General) or B.A. (Special) program in Comparative Literature that they include in their overall program a language other than English (for native English speakers), or French (for native French speakers).

(1) The Degree of B.A. (General)

(a) See § 43.1.2(2)d.

(b) The following course sequences are strongly recommended:
Three-course sequence: C LIT 201/202 (or C LIT 301/302); C LIT 351; C LIT 352; C LIT 362.
Four-course sequence: same as above plus C LIT 358/359.
Five-course sequence: same as above plus C LIT 340.

(2) The Degree of B.A. (Special) This program lends itself to students who seek to learn more about the interaction of literatures among themselves or with other fields in the Humanities or Social Sciences.

(a) See § 43.1.3(2)d.

(b) A program of study will be arranged in consultation with the student advisor. The following course sequence is strongly recommended to students who choose the five-course minimum requirement:

1. Students beginning Comparative Literature studies in year one:
First year: C LIT 201/202.
Second year: C LIT 351 and C LIT 352.
Third year: C LIT 362; C LIT 364.
Fourth year: C LIT 455 and one senior-level Comparative Literature option.

2. Students beginning Comparative Literature studies in year two:
Second year: C LIT 301/302; C LIT 351; C LIT 352.
Third year: C LIT 362; C LIT 364.
Fourth year: C LIT 455; one senior-level Comparative Literature option.

43.7 Drama

43.7.1 HONORS IN DRAMA

See § 43.1.1. for Faculty regulations concerning the Honors program.

The Honors program offers the exceptional student an opportunity for intensive study in Drama. The appropriate areas of study are Dramatic Literature, Theatre Aesthetics and Theatre History. Some practical experience of the theatre is also desirable and students are encouraged to enrol in practical courses and to participate in departmental productions.

Students are advised to enter the program in first year, however, later entry is possible. Admission requirement are the same as the Faculty requirements, but for promotion from year to year, in addition to the 6.5 minimum grade-point average required by the Faculty the Drama department requires a grade of 7 or better in the following courses which constitute the core of the program; Drama 300, 400, 405, 500, 505. To ensure their studies are sufficiently broad, students are required to take a minimum of eight courses, but not more than a maximum of eleven courses in the Drama Department. Ability in a language other than English to the 300-level is also required.

The program outlined below is not completely rigid and can be subject to some variation. It is, however, an indication of the courses the applicant will be advised to take.

1st Year
English 200 or equivalent
Laboratory Science
Junior Drama option
Two non-Drama options (200 level language other than English advised for one).

2nd Year
Drama 300
Two Drama options
One non-Drama option
One non-Fine Arts option

3rd Year
Drama 400
Drama 405 (½)
One ½ Drama option
One non-Drama option
One non-Fine Arts option

4th Year
Drama 500
Drama 505
Three options (may be Drama)

NOTE: Drama options may be chosen from all courses not designated as restricted to BFA only. In addition to the requirements set out above, each program must include at least one Drama course from at least three of the following areas: production and design; directing; playwriting; acting and improvisation.

The above program is based on the assumption that the student is not taking a minor. Students wishing to do so, should consult with the Honors advisor.

In the final year an Honors essay will be required. This, however, will arise out of the work done in Drama 505.

Students are advised to take note of 43.1.1, especially the subsection entitled "Academic standings and graduation", for requirements of other degree programs, in case they find it necessary to withdraw from the Honors program.

43.7.2 CONCENTRATION IN DRAMA

(1) The Degree of B.A. (General)

(a) See § 43.1.2(2)d.

(b) The Department recommends five full-course equivalents including Drama 251, Drama 275, two full-year Theatre History courses, and the equivalent of two full-year Drama options.

(2) The Degree of B.A. (Special)

(a) See § 43.1.3(2)d.

(b) Students are advised to include Drama 251, Drama 275, and the equivalent of two full-year Theatre History course in their programs. The Department of Drama requires a minimum of six full-year course equivalents in Drama. For specific recommendations and advice on specialization within Drama consult the Department.

For the degree of B.F.A. in Drama, see § 43.1.12.

43.8 East European and Soviet Studies

43.8.1 HONORS IN EAST EUROPEAN AND SOVIET STUDIES

An Honors degree with an East European and Soviet Studies specialization can be taken through one of the departments of Economics, History, Political Science, or Slavic Languages. These special programs are designed by the department concerned in conjunction with the Dean's Office. Programs may include area-related courses listed in the Calendar under Comparative Literature, Economics, Geography, History, Political Science, the various Slavic Languages, Interdisciplinary Courses and the Faculty of Education. These programs must include an approved language component. Further information may be obtained from the Office of the Dean.

43.9 Economics

43.9.1 HONORS IN ECONOMICS

Entrance to the Honors Economics program will ordinarily take place at the end of the first year of university studies. Entrance may be granted by the Department at an earlier or later stage depending on circumstances. The normal requirements for the full four-year program are set out below. Variations in the program between years may take place provided that the appropriate course prerequisites are satisfied.

Variations with respect to the overall program requirements in Economics or other subjects may be recommended by the Department in cases of an unusually strong background in Mathematics, Statistics or other quantitative subjects, or in other special circumstances.

First year: Economics 201/202, one approved junior course in Mathematics, one course at the 200-level in English, and two options.

Second year: Economics 381/382, Economics 395/396 or an approved course in Statistics, an approved option in Economics, plus two options.

Third year: Three approved options in Economics, plus two options.

Fourth year: Economics 481/482, two approved options in Economics, plus two options.

NOTE A: Economics 407/408 and Economics 486/487 are recommended for students contemplating graduate school and/or professional work in Economics.

NOTE B: Supporting senior courses in Mathematics or Statistics are ordinarily suggested somewhere in the list of general options. Accounting 202 and 204 together are acceptable as an option at any stage in the program as are additional courses in Economics.

NOTE C: Those students who take Statistics 255 will have met the Faculty requirement for an approved junior laboratory science course.

Students wishing to undertake a program of East European and Soviet studies may register for Honors in Economics. By choosing options according to the program requirements set out by the Dean's office, students may qualify to have the notation "East European and Soviet Studies" added to their record upon satisfactory completion of their program.

43.9.2 HONORS IN ECONOMICS AND MATHEMATICS

See § 43.1.1 for Faculty regulations concerning the Honors program.

First and Second Years: ECON 201/202, ECON 381/382, MATH 207/208, MATH 281/282, MATH 307/308, STAT 365/366, one junior English course, three options.

Third and Fourth Years: ECON 481/482, MATH 381/382, at least three additional Economics options, at least one additional MATH/STAT option, four options.

Each program must have the approval of the Departments of Economics and Mathematics. It is recommended that students have at least one course in Computing Science.

43.9.3 CONCENTRATION IN ECONOMICS

(1) The Degree of B.A. (General)

(a) See § 43.1.2(2)d.

(b) General program students who may wish to transfer to the Honors program or to proceed later to graduate study in Economics should consult the Department. Such students are reminded that basic courses in Calculus, Algebra, and Statistics are prerequisite to graduate work in the Department.

(2) The Degree of B.A. (Special)

(a) See § 43.1.3(2)d.

(b) The Department recommends Economics 381/382 to students in this program; students interested in graduate work in the Department are reminded that basic course work in Calculus, Algebra, and Statistics are prerequisites for such study.

(c) If the second subject is Mathematics, MATH 202/204, MATH 221/222, MATH 302/303 and STAT 365/366 are strongly recommended.

43.10 English

43.10.1 HONORS IN ENGLISH

There is no specific first year Honors in English. However, students planning to enter the second year of the program should consult the Chairman of the Department Honors Committee before registering for their first year to plan their program according to the following model:

English 200 or one full-session course, or two single-term courses, in English at the 200-level; French 200 or French 205 and 206 or French 230, or Latin 100 or German 200 or Italian 100 or, with permission, another language; an approved Philosophy or History course; an approved laboratory science course; an approved option, which may be a second language. Students deciding during or at the end of the first year to undertake Honors in English must consult the Honors Advisor at the earliest possible moment in order to as-

certain that their first-year courses provide an adequate basis, or to discuss what extra work should be taken to rectify the situation. The normal requirements for the program are set out below. Variations in the program (including directed reading courses) need the permission of the Honors Advisor.

Second year: Three senior English courses; continuation of the first language; an approved option, provided that language requirements have been met; English 301.

Third year: Three senior English courses; two approved options, provided that language requirements have been met; English 401. English 503 will be commenced in the spring of this year and continued throughout the fourth.

Fourth year: Two senior English courses; two approved options, both of which may be senior English courses if language requirements have been met; English 503 is to be continued and will count as a fifth course; English 501.

Choice of senior courses: A student may take up to eleven full-session senior English courses or the equivalent thereof.

a. *REQUIRED:* a full-year course (or two half-year courses) in each of the following areas:

(1) Old and Middle English

(2) Sixteenth and Early Seventeenth-Century Literature, including Shakespeare

(3) Later Seventeenth-Century Literature, including Milton; Restoration and Eighteenth-Century Literature

(4) Romantic and Nineteenth-Century Literature

b. *STRONGLY RECOMMENDED:*

(1) Twentieth-Century British and/or American Literature

(2) Canadian Literature

(3) A genre course (drama, the novel, poetry)

Students planning to continue into graduate study should be aware of the advisability of being well-grounded in such major figures as Chaucer, Shakespeare, and Milton.

Language requirements: A student who begins his/her first language at University (one chosen to satisfy the language requirement of the first year) must continue it for two more years. If the language of the first year is a language of matriculation, it needs to be continued for one year only. A student who begins at University a second language (one elected as an approved option) must continue it for one more year, unless specially exempted.

43.10.2 CONCENTRATION IN ENGLISH

(1) The Degree of B.A. (General)
- (a) See § 43.1.2(2)d.
- (b) Students who choose English as a subject of concentration are advised to include in their program a language other than English.

(2) The Degree of B.A. (Special)
- (a) See § 43.1.3(2)d.

43.11 Geography

43.11.1 HONORS IN GEOGRAPHY

The Department of Geography offers both the B.A. and the B.Sc. degrees with Honors in Geography. Students wishing to stress the humanities and social sciences should register in the B.A. program; those who wish to stress the physical and biological sciences should register in the B.Sc. program.

The B.A. with Honors is designed to combine a broad training in geography with an opportunity to develop a special interest in some branch of the subject. The required grade-point average to enter and continue in the Honors program is 6.5. In addition, a minimum grade of 6 must be obtained in all geography courses and in any other course which is explicitly required by the Department.

Students intending to proceed to higher degrees and a professional career are advised that an ability to read and speak a second language, particularly French, is an asset; they are therefore encouraged to devote at least one option to a second language.

First year:
English 200 or equivalent
Geography 230/231 or 250/251
Statistics 241 or equivalent
Junior Arts option (Anthropology, Economics, History or Sociology)
One and a half options

Second year:
Geography 250/251 or 230/231
Geography 329/429
Cartography 341
Senior Arts option in Geography
Arts option, not Geography

Third year:
Senior regional option in Geography*
Senior Arts option in Geography
Senior Science option in Geography
Two approved Arts options (at least one in a field other than Geography)

Fourth year:
Geography 498
One senior single-term course in Geography
Senior Arts option in Geography
Two approved Arts options (at least one in a field other than Geography)
Option

*List of approved regional courses is available from the Department.

NOTE: Students intending to write an Honors thesis may present it in place of the senior Arts option in Geography. They should register in Geography 553 (0-6s-0) and contact the Undergraduate Program Committee by February 1st of the third year of the program.

During the fourth year a candidate for Honors will be required to take an oral examination in the field of Geography.

43.11.2 CONCENTRATION IN GEOGRAPHY

(1) The Degree of B.A. (General)
- (a) See § 43.1.2(2)d.
- (b) All students are advised to include Geography 230, 231, 250 and 251 in their programs. Those in a five-course sequence should add either Geography 329, 429, and/or Cartography 341, and one full-course equivalent in regional geography (a list of such courses is available in the Faculty Office and in the Department).

NOTE: Any Geography course, whether listed as an Arts or a Science course, may be counted as part of a concentration in Geography. Descriptions of Geography 230 and 231 and other Science courses will be found in the Faculty of Science section of the Arts and Science calendar.

Students interested in graduate work in Geography should consult the Chairman of the Department.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.
(b) Students are advised to include the following courses in their programs: Geography 230 and 231; Geography 250 and 251; either Geography 329, 429, or Cartography 341; and one full-course equivalent in regional geography (a list of such courses is available in the Faculty Office and in the Department).

Advice on specialization streams within Geography and related minor fields is available from the Department.

43.11.3 CONCENTRATION IN CARTOGRAPHY

Students may take Cartography as the second subject of concentration in either the B.A. (General) or B.A. (Specia) programs.

NOTE: This option is not available to students who are taking Geography as their principal subject of concentration.

The cartography courses are listed in § 184.7 of the Calendar. Students are advised to take CART 341 before proceeding to advanced-level courses.

43.12 Germanic Languages

43.12.1 HONORS IN GERMAN

An undergraduate may elect to read for Honors in German either at the beginning of the first year or after satisfactory completion of one or two years of the general B.A. degree program.

The program will normally require ten courses in German (including German 306/307, 301, 330, 511/512 or 441/442 and, in the fourth year, German 505), six approved options in supporting disciplines selected in consultation with the Department, one junior English course (see below), and three courses in the "Social Sciences" or "Natural Sciences" one of which must be a laboratory science according to Faculty regulations, for a total of twenty courses.

To meet the English requirement, the Department recommends that English 200 be taken in the first year. However, credit will be given for English 210 or any two half-year English courses at the 200-level.

All programs will be arranged in consultation with the Department; departmental approval of the program in any given year is required before registration.

43.12.2 COMBINED HONORS IN GERMAN

A degree with Honors in German and English, German and French, German and Latin, German and Philosophy, German and Russian and other combinations may be awarded to students following a program of studies similar to the one outlined above, except that the number of senior courses in each subject will be as nearly as possible equal and selected in accordance with departmental requirements.

43.12.3 CONCENTRATION IN GERMAN

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) Students may take any 300 or 400 level course after German 200, 201 or 202, but are advised to discuss their course selections with the Department.

German-speaking students and students beginning their studies with more than matriculation German may be admitted to courses numbering 300 and above in their first year, provided they pass a Departmental placement test and obtain the permission of the Dean of Arts. Such students are required to consult with the Department before registration.

German 330 and 350 may *not* be taken *after* any of the higher-level courses.

Senior, Honors, and Graduate courses in German literature will, in general, be conducted in German.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.
(b) Students who want to develop a strong concentration in German language and literature and other disciplines supporting the study of German culture, such as History, Political Science, Philosophy or Music, should contact the departmental B.A. (Special) Advisor.

43.12.4 CONCENTRATION IN SCANDINAVIAN

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department of Germanic Languages advises the following sequences:

(1) *For students beginning a Scandinavian language:* Scandinavian 100 in the first year; Scandinavian 300 and 340 or 351/352 in the second year; one or two of Scandinavian 340, 351/352, 375, 380 in the third year.

(2) *For students with matriculation or equivalent:* Scandinavian 300 in the first year; one or two of Scandinavian 340, 351/352, 375, 380 in the second year; one or two of Scandinavian 340, 351/352, 375, 380 in the third year.

(3) Students fluent in one of the Scandinavian languages should consult the Department.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.13 History

43.13.1 HONORS IN HISTORY

An undergraduate may elect to read for Honors in History either at the beginning of the first year or after satisfactory completion of one or two years of the general B.A. degree program. In any case he/she must consult the Department Honors Chairman before being admitted to the program. The degree of B.A. with Honors in History is awarded after satisfactory completion of an Honors essay, proof by the candidate of ability to read a modern language other than English, and the attainment of a satisfactory standard in the examinations taken in the third and fourth years, including a comprehensive examination. If students choose the same field for their Honors essay and comprehensive examination they must include in their program for the second, third and fourth years courses in another field of History to a total equivalent of not less than three full-session courses, including at least the equivalent of one full-session 400-level course.

First year: History 200 or equivalent, English 200 or equivalent, a laboratory science, two approved options (it is strongly advised that one of the options be a language other than English).

Second year: Two senior (300-level) courses in History, two approved options (Classics, Economics, English, Modern Languages, Philosophy, Political Science or Psychology for example), a further option (which may be a third History course).

Third year: Two advanced (400-level) courses in His-

tory, one of which should be in a field related to the topic proposed for the Honors essay of the fourth year; History 498; a senior level half-course in History; two approved options. The language examination must also be taken this year, unless the student elects to take it earlier.

Fourth year: An approved 500-level course in History; History 501 (preparation of the Honors essay); a further course in History (which may be at the 300 level); an approved option from another department.

In certain circumstances courses in Ancient History offered by the Department of Classics are accepted in place of required senior and advanced courses in History.

Not later than the beginning of the third year, students should select, in consultation with the Department, a special subject, on some aspect of which they will write their Honors essay. Instruction in a special subject or subjects is offered by most members of the Department. A few examples of possible special subjects are: Chaucer's England, Elizabethan England, Seventeenth Century France, Revolutionary France, European Imperialism, the Weimar Republic, the Russian Revolution, the Age of Jackson, the Hudson's Bay Company, Franco-Chinese relations.

The Honors essay will be written in the final year under the supervision of a member of the Department, with whom the candidate will confer regularly. The Department may require any candidate for Honors, in addition to submitting his or her essay, to pass an oral or written examination on the subject of the essay.

Every candidate for Honors in History must satisfy the Department of their ability in sight translation from a language other than English, chosen in consultation with the chairman of the Honors program. Language examinations are conducted by the Department at least twice a year: normally they are written in the candidate's second or third year.

In the final year the student is required to write a comprehensive examination in one of the following fields: British Medieval; British Modern; British Empire and Commonwealth; Canadian; American; Medieval European; European, 1500-1789; European 1789 to the present; Russian and East European; East Asian; or Latin American History.

Students should choose their courses with some attention to the comprehensive examination they wish to write. If they wish to write an Honors paper and a comprehensive examination in the same field, they should ensure that they include the required number of courses in another field of History.

Undergraduates wishing to enter a program of East European and Soviet Studies may register for Honors in History. They should then choose their options in accordance with the pattern prescribed by the Dean's office. On the satisfactory completion of the whole program, they qualify to have the notation "East European and Soviet Studies" added to their record.

Programs of combined Honors in History and another subject must be arranged in consultation with the Honors chairmen of both departments. History courses in a combined program will be selected in accordance with the departmental requirements outlined above.

43.13.2 CONCENTRATION IN HISTORY

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department offers the following advice: Students who select History as a principal subject of concentration are advised to take History 200 or equivalent in their first year. However, students may, except when a prerequisite is specifically required, take any senior History course (those in the 300 range) in their second or third year without a previous course in History. Students in their third year should choose an advanced course (in the 400 range) only if they have taken at least two previous courses in History, though exceptions may be made in the case of students with special interest and an adequate background in other related disciplines. Advanced courses are provided for third-year students who wish some specialization within areas covered generally by senior courses.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.14 Linguistics

43.14.1 HONORS IN LINGUISTICS

The Department of Linguistics offers courses leading to both the B.A. and the B.Sc. degrees with Honors in Linguistics. The B.Sc. Honors program can be found in the Faculty of Science section of the Arts and Science Calendar. The B.A. Honors program in Linguistics should be supported by a minor (4 or 5 full courses) in a field such as Anthropology, Classics, English, Germanic Languages, Psychology, Romance Languages, or Slavic Languages. The B.A. Honors program consists of eight full courses in Linguistics supported by courses in the minor area, plus additional approved options.

Although there are no first-year Honors Linguistics courses, students wishing to begin an Honors program are strongly advised to consult the Department well before the end of the first year. This is especially important for determining the minor area of concentration.

Second year: Linguistics 303/304; two senior half-year courses in Linguistics (such as Linguistics 305, 307, 308, 382, 416) chosen in consultation with the Department; three approved options.

Third year: Linguistics 405, 407, 409/410; two senior half-year courses in Linguistics (such as the above or Linguistics 408, 414, 420, 498) chosen in consultation with the Department; two approved options.

Fourth year: Linguistics 515/516; four senior half-year courses in Linguistics (such as the above or Linguistics 551, 552) chosen in consultation with the Department; two approved options.

43.14.2 CONCENTRATION IN LINGUISTICS

The Department offers courses leading to both the B.A. and B.Sc. degrees. Students are urged to consult the Department regarding these degrees and their program sequences.

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.15 Mathematics

43.15.1 HONORS IN MATHEMATICS

The B.A. Honors in Mathematics is a flexible program. The student can design the degree for a general liberal education or for a specific career.

The Department also offers three different B.Sc. programs with Honors in Mathematics. (See § 183.13.1)

First year: Mathematics 207/208, Mathematics 281/282 or 281/381, English 200 or equivalent; two options.

Second year: Mathematics 307/308; Mathematics 282 or 381, one term Mathematics option, three options.

Third and fourth years: Mathematics 495, Mathematics 442/443, Mathematics 405/406, Mathematics 409/410, Mathematics 425 or 427/428, five options.

Of the ten options, at least seven must be in Arts and at least one must be in a laboratory science. Note that the Faculty allows at most seven junior (200-level) courses. A student should consult the Department of Mathematics as soon as possible for specific suggestions on options in a program.

Each program must be approved by the Honors Committee of the Department. Lists of Mathematics and Statistics courses with their descriptions appear in § 184 of this calendar. For Faculty requirements see § 43.1.1.

43.15.2 CONCENTRATION IN MATHEMATICS

(1) The Degree at B.A. (General)
(a) See § 43.1.2(2)d.

The usual first year calculus course for a general program student in Arts is Mathematics 202/204 or 203/204. However, general program students may take Mathematics 207/208 provided they have the permission of the Department. If students pass Mathematics 207/208, they may apply to the Department for admission to second year Honors. Students with a good record in Mathematics 202/204 or 203/204 may also apply to the Department for admission on the understanding that their record will be considered equivalent to Mathematics 207/208. If such students are granted admission they must satisfy all the requirements of the Honors program they have chosen.

A list of Mathematics courses, together with their descriptions, appears in § 184 of this Calendar.

Students should consult the Department as early as possible regarding the choice of their courses.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.16 Music

43.16.1 HONORS IN MUSIC

The B.A. (Honors) in Music is available to undergraduates with primary interests in music history and/or theory, and with aspirations to proceed into graduate study in those areas. Students are encouraged to seek admission to the program in the first year of university study, but may be admitted later at the discretion of the Department. Prospective honors students in music are advised to register in Music 202, 203, 250, and 251 during their first year. Departmental approval of individual programs is required prior to registration. Students are advised to consult § 43.1.1 of the Arts Calendar when formulating programs, in order to ensure adherence to Faculty regulations and cognizance of requirements for possible transfer to other programs.

(1) *Requirements:*
A. Music:

	Courses	
1. Theory: 250, 251, 350, 351, 352, 361	3.5	
2. History: 202, 203, 301, 304, 402, 505	3.0	
3. Applied Music: 224, 324, 424	1.5	
4. Options (senior theory or history)	3.0	11.0
B. Language:		
1. English: 200, 210 or equivalent	1.0	
2. Other (German, French, Italian, Latin)	2.0	3.0
C. Non-Music Options (Including at least one related history course and an approved laboratory science course) (Arts or Science only)		6.0
Total courses (full session equivalent)		20.0

(2) *Proposed Yearly Format:*

First Year: Music 202, 203, 250, 251; English 200 or equivalent; language; 1 non-music option.

Second Year: Music 224, 301, 304, 350, 351; language; 1 ½ non-music options.

Third Year: Music 324, 352, 361, 402; 2½ non-music options.

Fourth Year: Music 424, 505, 3 music options; 1 non-music option.

43.16.2 CONCENTRATION IN MUSIC

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
(b) See § 43.1.3(2)d.

For the degree of B.Mus., see § 43.1.13.

43.17 Philosophy

43.17.1 HONORS AND COMBINED HONORS IN PHILOSOPHY

Degrees with honors from this Department will fall into two groups.

(1) B.A. with Honors in Philosophy and approved minor subject.

(2) B.A. with Honors in Philosophy combined with another approved subject (e.g., Greek, German, etc.)

Students are advised to consult the Department for information before choosing one of the groups, and in any case, Departmental approval of the final program of studies is required before registration. In the case of students taking combined Honors, the program will be arranged in consultation with the other department concerned.

Honors in Philosophy will require a minimum of nine courses in Philosophy, including the Honors seminar (PHIL 496 and 497) in the third year and the Honors tutorial (PHIL 422, 423, 552 and 553) in the final year. Four courses in a minor subject, or an integrated selection of five or six in a group of subjects will also be required.

Students will arrange their particular program in consultation with an advisor appointed by the Department. In every case the student will be required to obtain a good grounding in the history of philosophy, and provide a demonstration of competence in logic.

43.17.2 CONCENTRATION IN PHILOSOPHY

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department strongly recommends the following sequences:

Three-course sequence: Philosophy 240 or 250, and two senior options.

Four-course sequence: Philosophy 240 and/or 250, two of Philosophy 341, 343, 345 or 347, and one or two options.

Five-course sequence: Philosophy 240, 250, two of Philosophy 341, 343, 345 or 347, and two options.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d and consult the Department.

43.18 Political Science

43.18.1 HONORS IN POLITICAL SCIENCE

All students are required to demonstrate to the Department, competence in statistical techniques, subject to the right of the Department to waive this requirement in special cases.

First year: Political Science 201/202; an introductory course in English (full-session or equivalent); three options (one to be an approved laboratory science course), chosen in consultation with the Department.

Second year: Two courses in Political Science; three options to be chosen in consultation with the Department.

Third and Fourth years: Before entering the third year, each student will arrange, in consultation with the Department, a program of study and lectures to prepare himself for final comprehensive examinations. Unless it has been taken in earlier years, a course in a language other than English, preferably French or German or Russian, is required.

Students wishing to undertake a program of East European and Soviet studies may register for Honors in Political Science. By choosing their options according to the course requirements set out by the Dean's office, students may qualify to have the notation "East European and Soviet Studies" added to their record upon satisfactory completion of their whole program.

43.18.2 CONCENTRATION IN POLITICAL SCIENCE

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department advises the following sequences:

For the three, four and five-course sequences: Political Science 201/202 plus the equivalent of two, three or four other full-year senior Political Science courses.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.19 Psychology

43.19.1 HONORS IN PSYCHOLOGY

The Department offers courses leading to the degrees of B.A. and B.Sc. with Honors in Psychology. Students wishing to emphasize the humanities and social sciences in their program should register for the B.A.; those who wish to emphasize the physical and biological sciences should register for the B.Sc. With either degree, the program is especially, but not exclusively, appropriate for students considering postgraduate study, training, or research in pyschology.

The Department requires that students have a 7.0 GPA from the immediately preceding year in order to enter the program, and maintain a 7.0 GPA each year in order to continue in the program. Students are not normally admitted to the first year of Honors in Psychology; they may not enter the program after the beginning of the third year.

Honors in Psychology requires a minimum of eight and a maximum of ten full-session courses (or equivalent) in Psychology including the following: Psychology 309 (prerequisite Mathematics 30 or 100) or, with consent of the Department, Statistics 255 or Computing Science 322; one Science course with laboratory; one Arts course; and the Honors Seminars 306 and 307 and 406 and 407. The Honors Seminars will ordinarily be taken in the second and third years of the student's residence in the Honors program at the University. An important feature of the Honors program is the opportunity for the student to engage in independent study and research. During the third year, students will complete a research apprenticeship and, during the fourth year, the student will write an empirical Honors thesis (Psychology 599), both with the guidance of a faculty member of the Department of Psychology. A minimum of five courses will be taken in related subjects. The courses in related subjects might be all in one field (e.g., Mathematics or Biology) or in several, depending on the student's special interest and relevance of the courses to the subject matter of psychology.

In addition a minimum of five optional courses will be chosen; some of these will be integrated with the program in Psychology while others can be general options.

43.19.2 CONCENTRATION IN PSYCHOLOGY

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.

The Department offers courses leading to both the B.A. and B.Sc. degrees. Students wishing to emphasize the biological sciences in their program should register for the B.Sc.; those wishing to emphasize the humanities and social sciences should register for the B.A. degree.

The Department advises the following sequences:

Three-course sequence: Psychology 260 and 261; Psychology 309; one senior single-term course (with laboratory) listed in the Science section of the Calendar; one senior Psychology course listed in the Arts section of the Calendar.

Four or five-course sequence: As above, plus either one or two senior Psychology courses which may be chosen from the Calendar listings of either Faculty.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.
(b) The Department advises the following sequences:
(i) Psychology 260 and 261.
(ii) Psychology 309 (or, with the consent of the Department, Statistics 255 or Computing Science 322).
(iii) at least one of Psychology 360, 361, 362 or 366.
(iv) at least one of Psychology 341 or 383.

43.20 *Religious Studies*

43.20.1 HONORS IN RELIGIOUS STUDIES

The Department of Religious Studies offers a program leading to the B.A. with Honors. Students must complete a minimum of 10 full courses in Religious Studies with at least 2 drawn from each of the following areas: Thematic and Methodological Studies, Eastern Religions, and Western Religions. Religion 200 or equivalent and one 400-level full-year course are required of all candidates. Under certain conditions, students may substitute up to 2 full-year courses of the required 10 with language courses related to their area of concentration. Every candidate for Honors in Religious Studies must satisfy the Department of his or her ability in sight translation from a language other than English, chosen in consultation with the Department Advisor. It is suggested that students fulfill all requirements for a general B.A. and maintain a strong minor for alternate career choices. All programs must be approved by the Department Advisor before registration. For further information contact the Department of Religious Studies.

43.20.2 CONCENTRATION IN RELIGIOUS STUDIES

(1) The Degree of B.A. (General)
 (a) See § 43.1.2(2)d.

(2) The Degree of B.A. (Special)
 (a) See § 43.1.3(2)d.

43.21 *Romance Languages*

43.21.1 HONORS IN ROMANCE LANGUAGES

The Department of Romance Languages offers various Honors programs requiring study within one or more of the following fields: the French language and its literatures, the Hispanic languages and literatures, Italian language and literature, and Romance Linguistics. Honors programs combining one of these fields with a second subject in another department are also offered. For further information students should apply to the departmental office.

43.21.2 CONCENTRATION IN ROMANCE LANGUAGES

(1) The Degree of B.A. (General)
 (a) See § 43.1.2(2)d.
 (b) Students may concentrate in French and/or French-Canadian, or in Italian, or in Spanish, or in Romance Linguistics. A combination of courses in any one of these areas will be accepted as a subject of concentration.

(2) The Degree of B.A. (Special)
 (a) See § 43.1.3(2)d.
 (b) In the principal subject a minimum of six courses is required by the Department.

NOTE: French-Canadian courses can be taken in meeting requirements for the B.A. degree in Canadian Studies (see § 43.1.6).

43.22 *Slavic Languages*

43.22.1 HONORS IN SLAVIC LANGUAGES

(1) A program of study in either *Russian* or *Ukrainian* with an approved second subject (e.g., French, German, or Comparative Literature, etc.). The program will require eight courses in either Russian or Ukrainian, four courses in the second subject and approved options to a total of twenty courses.

(2) A program of study in *Slavic Languages* with a major in either Russian or Ukrainian, and a minor in Polish, Slavics or Ukrainian (for students majoring in Russian), or in Polish, Russian, or Slavics (for students majoring in Ukrainian). The program will require eight courses in the major, four to six courses in the minor, and six to eight options, for a total of twenty courses. In all programs, the minor must include Slavics 301, 302, and 403, and, in the fourth year, Slavics 515.

(3) A *Combined Honors Program* involving for example, the study of Russian or Ukrainian and an approved second subject such as French, German, or Comparative Literature, etc. Programs in this group will require that the number of senior courses in each subject be as nearly equal as possible.

(4) A special program in *East European and Soviet Studies* with either Russian or Ukrainian serving as the core (a mixture of Russian and Ukrainian courses can be arranged in accordance with departmental requirements). Programs in this group will require six courses in either Russian or Ukrainian, six courses approved by the Dean's office, and approved options to a total of twenty courses.

All programs must include an approved laboratory science course and English 200 or equivalent in the first year and, in subsequent years, such laboratory hours as may be deemed necessary to increase the student's oral proficiency in Russian or Ukrainian.

NOTE: The term "course" in all of the above programs means either one full-session course or two single-term courses.

43.22.2 CONCENTRATION IN POLISH

(1) The Degree of B.A. (General)
 (a) See § 43.1.2(2)d.

43.22.3 CONCENTRATION IN RUSSIAN

(1) The Degree of B.A. (General)
 (a) See § 43.1.2(2)d.
 (b) The Department advises the following course sequences:

Three-course sequence: Russian 100, 303 and 304, and any two senior single-term courses.

Four-course sequence: Russian 100, 303 and 304, 401 and 402, and any two senior single-term courses.

Five-course sequence: Russian 100, 303 and 304, 401 and 402, and any four senior single-term courses.

(2) The Degree of B.A. (Special)
 (a) See § 43.1.3(2)d.

43.22.4 CONCENTRATION IN UKRAINIAN

(1) The Degree of B.A. (General)
 (a) See § 43.1.2(2)d.
 (b) The Department advises the following course sequences:

Three-course sequence: Ukrainian 100, 303 and 304, and any two senior single-term courses, or Ukrain-

ian 200, 361 and 362, and any two single-term courses at the 400 level.

Four-course sequence: Ukrainian 100, 303 and 304, 361 and 362, and any two single-term courses at the 400 level; or Ukrainian 200, 361 and 362, and any four single-term courses at the 400 level.

Five-course sequence: Ukrainian 100, 303 and 304, 401 and 402, and any four single-term courses at the 400 level; or Ukrainian 200, 361 and 362, and any six single-term courses at the 400 level.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.

43.23 Sociology

43.23.1 HONORS IN SOCIOLOGY

Degrees with Honors in Sociology will require eight to ten courses in Sociology. Depending on the special interests of the student, five or six courses in a related minor subject will be taken. The minor may be all in one field or in two fields, the latter option contingent upon Departmental approval. An additional five or six courses outside the field of Sociology and the minor will be required to complete the program. Departmental approval of the final program is required before registration.

Students in the Honors program are encouraged to obtain a working knowledge of a modern language other than English, preferably French.

The usual program in Honors Sociology is shown below. All required courses are listed.

NOTE: Options referred to below are all full-year courses or their half-year equivalents. Required courses marked with an asterisk are half-year courses.

First year: Sociology 202, English 200 or equivalent, a laboratory science, a non-social science option, an option.

Second Year: Sociology 400*, Sociology 311 or equivalent, Sociology 341* (or Psychology 341*), Sociology 351*, Sociology 361*, a minor option, an option.

Third year: Sociology 404* or 405*, Sociology 332*, Sociology 333*, a Sociology option*, two minor options, an option.

Fourth Year: Sociology 409, one Sociology option at the 400 level, a minor option, two options.

Students in the fourth year of study will be required to complete successfully a major paper (the Honors essay) and to pass a comprehensive examination. The comprehensive examination may be written or oral in format and is supervised by at least two faculty members. At least one member of the Comprehensive Examination Committee must be selected from the Sociology Department.

43.23.2 CONCENTRATION IN SOCIOLOGY

(1) The Degree of B.A. (General)
(a) See § 43.1.2(2)d.
(b) The Department advises the following sequences:

Three-course sequence: Sociology 202 and two senior Sociology courses;

Four-course sequence: Sociology 202 and three senior Sociology courses (including one 400 level course);

Five-course sequence: Sociology 202 and four senior Sociology courses (including one 400 level course).

Students interested in proceeding to graduate work in Sociology should take Sociology 311 and 332, and are encouraged to consult with the Department early in their university career.

(2) The Degree of B.A. (Special)
(a) See § 43.1.3(2)d.
(b) Students must take the following Sociology courses as part of their program: Sociology 202, 311, 341*, 361*, 332*, 333*, and a Sociology option* at the 400 level.

NOTE: Those courses marked with an asterisk (*) are half-year courses.

44 DETAILS OF COURSES

44.1 General Information

Courses are listed alphabetically by discipline designation, e.g., Art, English, Interdisciplinary Studies, etc.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 and up are normally restricted to Graduate students and fourth year Honors students.

Following the title of the course is the symbol "★", standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. Some courses are offered for credit only, and carry no weight.

In parentheses, after the course weight, will be found the term in which the course is offered and the weekly lecture, seminar and laboratory hours. The latter are arranged according to the following three-position format:

First position:
lecture hours

Second position:
s — seminar hours
d — demonstration hours
c — clinic hours
L — lecture-laboratory hours

Third position:
laboratory hours.

Examples: (First Term, 3-0-3) means 3 hours lecture, no seminar, three hours lab per week.

(Second Term, 0-1s-2) means no lectures, 1 seminar hour, and two lab periods per week.

(either term, 3-0-0) means three lecture hours per week, no seminar, and no lab.

NOTE 1. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated.

NOTE 2. "either term" means that the course may be offered either in the first term or in the second term or in both terms, at the discretion of the department concerned.

Some departments offer reading courses designed to fit the interests of advanced students not covered in the departments' other courses. Interested students should seek departmental assistance.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

NOTE: § 44.2 Reserved.

44.3 Anthropology

44.3.1 JUNIOR COURSES

ANTHR 202. *Man and Culture.* ★6 (3-0-0). An introduction to anthropological thought concerning such topics as race, evolution, culture growth, and culture change. Not open to students with credit in ANTHR 306 or 307.

ANTHR 250. *Race and Racism in the Modern World.* ★3 (either term, 3-0-0). The challenge of racism in modern societies and the response of anthropology, including the history of the "race" concept in explaining human variation and the uses of racialist notions in discussions of individual and social differences.

44.3.2 SENIOR COURSES

ANTHR 306. *Introduction to Prehistory.* ★3 (either term, 3-0-0). The nature, purposes, theory, and methods of prehistory and its relation to anthropology as a whole. Note: Not open to students who have taken ANTHR 202.

ANTHR 307. *Introduction to Social and Cultural Anthropology.* ★3 (either term, 3-0-0). The comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics and political institutions, and religion; processes of change. Note: Not open to students who have taken ANTHR 202.

ANTHR 308. *Introduction to Linguistic Anthropology.* ★3 (either term, 3-0-0). The anthropological study of language and communication. A brief survey of field and analytical methods and the theory of linguistic anthropology.

ANTHR 309. *Introduction to Physical Anthropology.* ★3 (either term, 3-0-0). Survey of theory and basic data in human evolution and human variation. Topics include primatology, osteology, hominoid paleontology, variation in modern populations.

ANTHR 319. *World Prehistory.* ★3 (either term, 3-0-0). A survey of the archaeological evidence for human cultural evolution.

ANTHR 325. *Anthropology and World Problems.* ★6 (3-0-0). An anthropological approach to the culture of capitalism, the social structure of colonial and neocolonial relations, and the emergence of new societies.

ANTHR 327. *Indigenous and Cultural Minorities in the Modern World.* ★6 (3-0-0). The survival of indigenous and minority cultures in various societies. Anthropological perspectives on the relationships among race, class, culture, and politics, and on genocide, ethnocide, and the future of native peoples in the modern state. Prerequisite: An introductory course in social or cultural anthropology or sociology.

ANTHR 330. *Technology in Culture.* ★3 (either term, 3-0-0). An anthropological introduction to the evolution of tools and techniques; the adaptation of society to environment through technology; the interrelationship of technology, ideology, and social organization.

ANTHR 345. *Prehistory of Western and Central Europe.* ★3 (either term, 3-0-0). A survey of the prehistory of Europe (excluding the areas of classical civilizations) from the Mesolithic through the Iron Age: ca. 10,000 to 400 B.C.

ANTHR 346. *Peoples and Cultures of the Circumpolar Region.* ★3 (either term, 3-0-0). Comparative study of indigenous Arctic and sub-Arctic societies. Archaeological and ethnological considerations of northern societies of the Old and New Worlds.

ANTHR 350. *Indians of North America.* ★6 (3-0-0). A survey of North American Indian cultures and civilizations. Special attention given to social organization, economic systems, prehistoric and historic social change. Some emphasis on Indians of Canada in historic and present-day perspectives.

ANTHR 355. *Contemporary Canadian Native Peoples.* ★3 (either term, 3-0-0). Anthropological perspective on some current situations of native peoples in Canada.

ANTHR 361. *Peoples and Cultures of Middle America.* ★3 (either term, 3-0-0). A review of the cultural history of the native peoples of Mexico and Guatemala. Analysis of contemporary Indian communities. Note: Formerly part of ANTHR 360.

ANTHR 362. *Peoples and Cultures of South America.* ★3 (either term, 3-0-0). A review of the cultural history of the native peoples of South America. Analysis of contemporary Indian communities. Note: Formerly part of ANTHR 360.

ANTHR 370. *Peoples and Cultures of Oceania.* ★3 (either term, 3-0-0). Historical, economic, and environmental factors which have helped shape major cultures and subcultures of the central and southern Pacific region (Polynesia, Micronesia, Melanesia, and Australia).

ANTHR 371. *People and Cultures of Southeast Asia.* ★3 (either term, 3-0-0). Cultures and societies in Southeast Asia: Burma, Thailand, Malaysia, Cambodia, Laos, Vietnam, Indonesia, and the Philippines; origins and developments, modern forms, trends of change.

ANTHR 372. *Culture and Society of India.* ★3 (either term, 3-0-0). The development of Indian culture and society; social structure, religion, technology, economy, and polity in anthropological perspective.

ANTHR 373. *Peoples and Cultures of the Middle East.* ★6 (3-0-0). The major culture groups in the predominantly Islamic region extending from Morocco to Afghanistan; origins and development, modern forms, trends of change.

ANTHR 375. *Peoples and Cultures of Sub-Saharan Africa.* ★6 (3-0-0). The indigenous cultures of the sub-Saharan part of the continent, with emphasis on present-day trends of change.

ANTHR 377. *Afro-American Society and Culture.* ★6 (3-0-0). Anthropological perspectives on the key problems of Afro-American life; slavery, racism, race and class, oppression, and colonialism. Descriptive materials from Canada, the United States, the Caribbean, and Latin America.

ANTHR 378. *Culture and Society of China.* ★3 (either term, 3-0-0). The development of Chinese culture and society; social structure, religion, technology, economy, and polity in anthropological perspective. Note: Formerly part of ANTHR 374.

ANTHR 379. *Culture and Society of Korea.* ★3 (either term, 3-0-0). The development of Korean culture and society; social structure, religion, technology, economy, and polity in anthropological perspective. Note: Formerly part of ANTHR 374 and 376.

ANTHR 380. *Culture and Society of Japan.* ★3 (either term, 3-0-0). Historical background, ethos and personality, social structure, religion, art, and modernization. Note: Formerly part of ANTHR 376.

ANTHR 390. *Human Evolution.* ★6 (3-0-3). Hominoid paleontology and micro-evolutionary change in the primates. Note: This course is accepted to meet the laboratory science requirement in B.A. programs. Prerequisite: ANTHR 309, or a course in biology or zoology, or consent of the Department.

ANTHR 391. *Topics in Human Evolution.* ★6 (3-0-0). Primate paleontology and micro-evolution. Prerequisites: ANTHR 202, or 309, or a course in biology or zoology, or consent of the Department.

ANTHR 392. *Primate Behavior.* ★3 (either term, 3-0-0). Emphasis on field studies of non-human primates. Topics to include: social organization, behavior and ecology, territorial behavior communication, reproductive behavior, and other relevant topics.

ANTHR 396. *Archaeological Field Training.* ★6 (Spring or Summer Session, 3-0-3). Instruction in all practical aspects of archaeological field techniques, including excavation, survey, recording, photography, and conservation. Held at a selected location in Alberta during both Spring and Summer Sessions. Prerequisites: ANTHR 202, or 306, or equivalent, and consent of the Department.

ANTHR 399. *Third-Year Honors Seminar.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ANTHR 404. *Human Biology.* ★6 (3-0-0). The study of variation in human populations. Topics discussed include serology, ecology, growth, and constitution. Prerequisite: One of ANTHR 309, 390, 391, 392, or consent of the Department.

ANTHR 405. *Old World Prehistory I.* ★3 (either term, 3-0-0). The development of prehistoric culture in Europe, Africa, and Asia during the lower and middle Paleolithic. Prerequisite: ANTHR 202, or 306, or consent of the Department. Note: Formerly part of ANTHR 401.

ANTHR 406. *Old World Prehistory II.* ★3 (either term, 3-0-0). The development of prehistoric culture in Europe, Africa, and Asia during the upper Paleolithic and Neolithic. Prerequisite: ANTHR 202, or 306, or consent of the Department. Note: Formerly part of ANTHR 401.

ANTHR 410. *Sex and Status in Comparative Perspective.* ★3 (either term, 3-0-0). Sexual status as a biological and as a cultural phenomenon. The social position of women in various societies. Prerequisite: A senior-level course in anthropology or sociology.

ANTHR 411. *New World Prehistory.* ★6 (3-0-0). A survey of the prehistoric development of culture in the New World. Prerequisite: ANTHR 202, or 306, or consent of the Department.

ANTHR 412. *Slavery and Slave Societies.* ★3 (either term, 3-0-0). Slavery as an organization of production and its implications for social and economic development. Prerequisite: ANTHR 202, or 307, or introductory course in sociology or history. Note: ANTHR 325, or 327, or 377, and HIST 362 recommended.

ANTHR 413. *Social Structure.* ★6 (3-0-0). Anthropological theory and method concerning the analysis of kinship systems and other concepts of social organization with emphasis on data derived from non-Western societies. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 414. *Peasant Society and Culture.* ★3 (either term, 3-0-0). The analysis of modes of production, social organization and other aspects of culture in agrarian societies, including anthropological perspectives on development. Prerequisites: ANTHR 307 and one other 300-level course. Note: Formerly ANTHR 417.

ANTHR 415. *History of Anthropology.* ★3 (either term, 3-0-0). A discussion of major figures and theories of anthropology, intended as a background to current problems. Prerequisite: ANTHR 202 and one other course in anthropology.

ANTHR 418. *Political Anthropology.* ★3 (either term, 3-0-0). An introduction to modern political anthropology with emphasis on the origins of state structures, the relations between non-state and state societies, and the problems of pluralism and stratification. Prerequisites: ANTHR 307 and one other 300-level course.

ANTHR 419. *Pastoral Societies.* ★3 (either term, 3-0-0). A cross-cultural survey of both nomadic and sedentary forms of pastoral adaptions stressing the relationship between herding and patterns of social organization, technology, ideology, and values. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 420. *Anthropology of Religion.* ★6 (3-0-0). Supernatural beliefs and practices in primitive and peasant cultures, including magic, shamanism, priesthoods, taboos, and folk-beliefs. Evolutionary, historical, and functional theories of religion. Prerequisite: A course in anthropology or sociology, or consent of the Department.

ANTHR 421. *Revitalization Movements in Anthropological Perspective.* ★3 (either term, 3-0-0). The anthropological study of emerging religions; the relation of revitalization movements to social, political, and economic conditions.

ANTHR 423. *Ecological Anthropology.* ★3 (either term, 3-0-0). A consideration of the relationships between culture and the environment. Problems involving the application of basic ecological concepts and principles to human societies and evaluation of various explanatory frameworks regarding cultural adaptations. Prerequisite: ANTHR 202, or 308, or 307, or consent of the Department. Note: Formerly part of ANTHR 422.

ANTHR 424. *Economic Anthropology.* ★3 (either term, 3-0-0). An introduction to the literature and controversies within the field, with special emphasis on systems of exchange. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 425. *Anthropology of Work and Production.* ★3 (either term, 3-0-0). The organization of work and production, with emphasis on the effects of development on subsistence economies. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 426. *Anthropological Perspectives in Ethnomusicology.* ★3 (either term, 3-0-0). Theory and method in the anthropological study of non-Western music. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 427. *Creative Expression I.* ★3 (either term, 3-0-0). Anthropological theory and method as applied to the study of the visual arts. Topics include the role of art in the evolution of man; general theories of art; and the relation between art, personality, and culture. Prerequisite: ANTHR 202, or 307, or consent of the Department. Note: Formerly part of ANTHR 425.

ANTHR 428. *Creative Expression II.* ★3 (either term, 3-0-0). Anthropological theory and method as applied to the study of primarily verbal arts such as mythology and folklore. Prerequisite: ANTHR 202, or 307, or consent of the Department. Note: Formerly part of ANTHR 425.

ANTHR 431. *Multilingualism.* ★3 (either term, 3-0-0). Emphasis will be on multilingual communities. Prerequisite: ANTHR 202, or 308, or consent of the Department.

ANTHR 433. *Ethnographic Semantics.* ★3 (either term, 3-0-0). To deal with the problem of classificatory categories of non-Indo-European languages. Prerequisite: ANTHR 202, or 308, or consent of the Department.

ANTHR 434. *Language Learning in Cultural Context.* ★3 (either term, 3-0-0). The ethnographic study of language learning and language use. Specific topics will include the study of primate communication, non-verbal communication systems, rule of communicative competence, and cross-cultural variation in teaching and socialization. Prerequisite: ANTHR 308 or consent of the Department.

ANTHR 435. *Language Prehistory.* ★3 (either term, 3-0-0). Language in time perspective and the reconstruction of culture history. Prerequisites: ANTHR 308, LING 201/202, or consent of the Department.

ANTHR 445. *Circumpolar Prehistory.* ★3 (either term, 3-0-0). A critical examination of archaeological method and theory applied to the circumpolar regions. Prerequisites: ANTHR 346, one other course in anthropology, or consent of the Department.

ANTHR 446. *Circumpolar Ethnology.* ★3 (either term, 3-0-0). A critical examination of anthropological models applied to traditional societies in the circumpolar regions. Prerequisites: ANTHR 346, one other course in anthropology, or consent of the Department.

ANTHR 447. *Culture and the Individual I.* ★3 (First Term, 3-0-0). A cross-cultural examination of the individual in society and culture and of the development of personality. Prerequisite: ANTHR 202, or 307, or consent of the Department. Note: Formerly part of ANTHR 442.

ANTHRO 448. *Culture and the Individual II.* ★3 (Second Term, 3-0-0). A continuation of 447. Examines decision making and behavior in interaction with the environment. Prerequisite: ANTHR 447 or consent of the Department. Note: Formerly part of ANTHR 443.

ANTHR 460. *Contemporary Anthropological Theory and Method.* ★3 (either term, 3-0-0). Examination of logical structure of research design, concept formation and explanation patterns in modern anthropology aimed at integrating existing knowledge of the field. Prerequisites: 3 to 4 courses in anthropology, and consent of the Department.

ANTHR 461. *Theory in Social Anthropology.* ★6 (3-0-0). A comparative examination of several contemporary social anthropological theories of the structure of society including functionalism, adaptation-evolutionary theory, structuralism, and Marxism. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 462. *Culture Change.* ★6 (3-0-0). Theories of the nature of socio-cultural systems and the process of change, with some emphasis upon their application to contemporary situations. Prerequisite: ANTHR 202, or 307, or consent of the Department.

ANTHR 463. *The Origins of Food Production.* ★3 (either term, 3-0-0). Archaeological evidence for the development of food production in the Old and New Worlds, discussed in the context of the major explanatory theories advanced. Prerequisite: ANTHR 202, or 306, or 319, or consent of the Department.

ANTHR 465. *Enculturation, Cultural Transmission and Cultural Change.* ★3 (either term, 3-0-0). The ethnographic study of education and cultural change. Prerequisite: ANTHR 202, or 307, or 325, or 350, or 355. Note: Formerly part of INT D 416.

ANTHR 470. *American Indian Linguistics.* ★6 (3-0-0). The study of Amerindian languages with special reference to problems of classification, to socio-cultural correlates of structural characteristics, and to the use of non-linguistic evidence for linguistic prehistory. Prerequisites: ANTHR 308, LING 301/302, or consent of the Department. Note: Formerly INT D 470.

ANTHR 471. *Readings in Anthropology I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

ANTHR 472. *Readings in Anthropology II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department.

ANTHR 478. *Advanced Studies in Latin American Indian Communities.* ★3 (either term, 3-0-0). Analysis and comparison of selected Indian communities. Emphasis on cultural ecology, social organization, values and world view, and relations with non-Indian society. Prerequisite: ANTHR 361, or 362, or another course on Latin America, or consent of the Department.

ANTHR 480. *Method and Theory in Prehistoric Archaeology.* ★6 (3-0-0). A comprehensive survey of the methods and techniques used in prehistoric archaeology, including auxiliary sciences; conceptual approaches and models used for interpreting archaeological data and cultural history; the relation of explanatory theory in cultural history to anthropology as a whole. Prerequisite: ANTHR 202, or 306, or consent of the Department.

ANTHR 482. *North American Regional Ethnology.* ★6 (3-0-0). Selected and comparative studies of North American Indian cultures. Special emphasis upon the relevance of North American ethnology to anthropological theory and method. Prerequisite: ANTHR 307 or consent of the Department.

ANTHR 483. *Cree Language and Culture.* ★6 (3-0-0). The Cree language is taught in collaboration with a native speaker in the context of its use in Cree communities. Indian etiquette and world view are salient in the cultural portions of this course. Prerequisite: An introductory course in ANTHR, or LING, or consent of the Department.

ANTHR 484. *Readings in Anthropology.* ★3 (either term, 0-3s-0).

ANTHR 485. *Readings in Social Anthropology.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ANTHR 486. *Advanced Readings in Anthropology.* ★3 (either term, 0-3s-0).

ANTHR 487. *Readings in Regional Ethnology.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ANTHR 488. *Field and Laboratory Methods in Paleoenvironmental Studies.* ★3 (First Term, 3-0-3). Prerequisite: Consent of the Department.

ANTHR 489. *Faunal Analysis for Archaeologists.* ★6 (0-3s-3). Seminar and laboratory analysis of faunal remains from archaeological sites. Prerequisite: Consent of Department.

ANTHR 490. *Human Osteology for Archaeologists.* ★3 (either term, 0-3s-3). Seminar and laboratory work on human osteology and prehistoric human skeletons. Prerequisite: Consent of Department. Note: Not open to medical students.

ANTHR 491. *Stone Tools.* ★3 (either term, 3-0-3). A methodological and theoretical introduction to the analysis of stone tools. Prerequisite: ANTHR 202 or 306, or consent of the Department.

ANTHR 492. *Problems in Primate Behavior.* ★3 (either term, 3-0-0). Examines kin selection in primates, sexual differentiation of behavior, evolution of primate behavior patterns, appropriateness of infraprimate analogies to human behavior. Prerequisite: ANTHR 392.

ANTHR 494. *Quarternary Environments II.* ★3 (Second Term, 3-0-0). A comprehensive survey of the Quarternary as a biologic and human environment. Prerequisite: GEOL 484 *(Quarternary Environments I).* Note: Formerly part of ANTHR 498.

ANTHR 495. *Archaeological Methods.* ★6 (3-0-3). The application of archaeological theory and methods to field and laboratory problems. Prerequisite: ANTHR 202, or 306, or 396, or consent of the Department.

ANTHR 496. *Advanced Readings in Anthropology.* ★6 (0-3s-0) Prerequisite: Consent of the Department.

ANTHR 497. *Early Man in the New World.* ★6 (3-0-0). A critica appraisal of data and theory bearing upon the entry, dispersion, and settlement of man in the Americas. Prerequisite Consent of the Department.

ANTHR 498. *Paleo-environmental Studies.* ★3 (either ter 3-0-0). Lectures on the use of ecological, geological, and cu tural data for the reconstruction and analysis of the role o humans in a prehistoric ecosystem. Prerequisites: GEOL 484 and ANTHR 494, or consent of the Department.

ANTHR 499 *Fourth-Year Honors Seminar and Honors Paper.* ★ (0-3s-0). Prerequisite: Consent of the Department.

44.3.3 HONORS AND GRADUATE COURSES

ANTHR 501. *History of Anthropology.* ★3 (either term, 0-3s-0) The development of the anthropological disciplines Prerequisite: Consent of the Department.

ANTHR 502. *General Scope of Anthropology.* ★6 (0-3s-0) Prerequisite: Consent of the Department.

ANTHR 503. *The Anthropology of Conflict.* ★6 (0-3s-0). Semina in cross-cultural research. Note: Restricted to graduate an honors students in Anthropology and Sociology except wit consent of the Department.

ANTHR 504. *Methods in Ethnology and Social Anthropology.* ★ (0-3s-3). Note: Restricted to graduate students an fourth-year honors students in Anthropology except with con sent of the Department.

ANTHR 505. *Field Methods in Ethnology and Social Anthropo ogy.* ★6 (0-3s-0). Note: Restricted to graduate students an fourth-year honors students in Anthropology except with con sent of the Department.

ANTHR 507. *Seminar in Linguistic Anthropology.* ★6 (0-3s-0) Selected topics in the area of the relations between cultur and language. Prerequisite: Graduate or fourth-year honor standing in Anthropology.

ANTHR 508. *Methods in Linguistic Anthropology.* ★3 (eithe term, 0-3s-3). Selected topics in field methods and analyti techniques used by linguistic anthropologists, and their exten sions in socio-cultural anthropology. Prerequisite: Consent o the Department.

ANTHR 510. *Theory of Culture.* ★6 (0-3s-0). Past and curren thought concerning the nature of culture and cultural change and such concepts as cultural evolution, diffusion, invention acculturation, patterns, and themes. Relation of theory t problems of planned culture change in underdeveloped areas Note: Open to fourth-year honors or graduate students in An thropology, or to others with consent of the Department.

ANTHR 515. *Seminar: The Transmission of Culture.* ★6 (0-3s-0) Note: Restricted to graduate students in Anthropology, Soci ology, or Education, except with the consent of the Depart ment.

ANTHR 516. *Selected Problems of Modern East Asia.* ★ (0-3s-0). Prerequisite: Restricted to graduate students an fourth-year honors students in Anthropology, except with con sent of the Department.

ANTHR 525. *Seminar: Problems in the Anthropology of Art.* ★3 (either term, 0-3s-0).

ANTHR 530. *Comparative Agrarian Societies.* ★6 (0-3s-0). Note Restricted to graduate students in Anthropology, Sociology and Political Science, except with consent of the Department.

ANTHR 535. *Anthropology and the Nation-state.* ★6 (0-3s-0) Restricted to graduate students in Anthropology, Sociology Political Science, or Economics. Prerequisite: Consent of the Department.

ANTHR 537. *Seminar in Anthropology of Development.* ★ (0-3s-0). Note: Restricted to graduate or fourth-year honor students in Anthropology.

ANTHR 540. *Conference Course in Regional Ethnology.* ★ (0-3s-0).

ANTHR 541. *Conference Course in Regional Archaeology.* ★ (0-3s-0).

ANTHR 542. *Individual Research.* ★6 (0-3s-0).

ANTHR 544. *Advanced Readings in Social Anthropology.* ★ (0-3s-0).

ANTHR 549. *Advanced Readings in Regional Ethnology.* ★ (0-3s-0).

ANTHR 550. *Topics in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 551. *Topics in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 552. *Topics in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 553. *Topics in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 554. *Seminar in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 555. *Seminar in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 556. *Seminar in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 557. *Seminar in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 558. *Contemporary Problems in Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 559. *Contemporary Problems in Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 590. *Advanced Physical Anthropology.* ★6 (0-3s-3). Prerequisite: ANTHR 390 or consent of the Department.

ANTHR 591. *Advanced Readings in Archaeology.* ★6 (0-3s-0).

ANTHR 592. *Current Problems in the Study of Fossil Hominidae.* ★3 (either term, 0-3s-0). Prerequisite: ANTHR 390 or consent of the Department.

ANTHR 595. *Seminar in Archaeology.* ★6 (0-3s-3).

ANTHR 598. *Prehistoric Cultural Ecology.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ANTHR 599. *Seminar in Paleoenvironmental Studies.* ★3 (Second Term, 0-3s-0). Prerequisites: ANTHR 488, and 498, or consent of the Department.

ANTHR 616. *Topics in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 617. *Topics in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 618. *Topics in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 619. *Topics in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 620. *Seminar in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 621. *Seminar in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 622. *Seminar in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 623. *Seminar in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 624. *Contemporary Problems in Anthropology I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

ANTHR 625. *Contemporary Problems in Anthropology II.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

44.4 Arabic

Department of Classics

44.4.1 JUNIOR COURSE

ARAB 100. *Introductory Literary Arabic.* ★6 (3-0-2). Pronunciation and grammar of Arabic from the Qur'an.

44.4.2 SENIOR COURSES

ARAB 300. *Intermediate Literary Arabic.* ★6 (3-0-0). Reading of classical and modern texts. Prerequisite: ARAB 100 or consent of the Department.

ARAB 400. *Advanced Literary Arabic.* ★6 (3-0-0). Selected readings from classical and contemporary Arabic authors. Prerequisite: ARAB 300 or consent of the Department. Note: This course will not be offered until 1982-83.

44.5 Art and Design

NOTE: The Department of Art and Design normally retains examples of students' work executed for class projects in Studio Courses.

Students enrolled in a B.A. (Special) or B.A. (General) program with their principal subject of concentration in Art may elect to take INT D 300 as either an Arts option or as one of the courses for credit within the requirements of the principal subject.

Students enrolled in the B.F.A. (Art and Design) program may elect to take INT D 300 as an Arts option only.

44.5.1 JUNIOR COURSES IN THE HISTORY OF ART AND DESIGN

ART H 201. *Introduction to the History of Art I.* ★3 (either term, 3-0-0). Introduction to European Art from the Middle Ages to the seventeenth century by analysis of selected works and movements. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 250.

ART H 202. *Introduction to the History of Art II.* ★3 (either term, 3-0-0). Introduction to the art of the seventeenth, eighteenth, nineteenth and twentieth centuries by analysis of selected works and movements. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 251.

ART H 250. *Survey of Western Art I.* ★3 (either term, 3-0-0). A survey of Western Art to the end of the Middle Ages. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 201.

ART H 251. *Survey of Western Art II.* ★3 (either term, 3-0-0). A survey of Western Art from the beginning of the Renaissance to the present day. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 202.

44.5.2 JUNIOR COURSES IN STUDIO

ART 231. *Visual Fundamentals.* ★6 (2-0-4). A studio based introduction to the exploration and production, in two and three dimensions, of visually expressed information. Note: Not open to students with credit in ART 232. Full course offered in the First Term.

ART 232. *Visual Fundamentals.* ★6 (2-0-4). A studio based course that provides B.F.A. students with an introduction to the exploration and production, in two and three dimensions, of visually-expressed information. Note: Restricted to B.F.A. students.

ART 233. *Visual Fundamentals.* ★6 (2-0-4). A studio based course that provides B.F.A. students with a further concentration in the exploration and production, in two and three dimensions, of visually expressed information. Prerequisite: ART 232 and consent of the department. Note: Full course offered in the First Term.

ART 240. *Drawing.* ★3 (either term, 2-0-4). Study of the principles and techniques of drawing. Note: Restricted to B.F.A. students.

44.5.3 SENIOR COURSES IN THE HISTORY OF ART AND DESIGN

ART H 300. *East Asian Art I.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of China from Shang to Sung. Note: Formerly part of ART 303.

ART H 301. *Medieval Art I.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the early Middle Ages (fourth to eleventh centuries) in Europe. Note: Formerly part of ART 301.

ART H 302. *Renaissance Art I.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the fifteenth century in Europe. Note: Formerly part of ART 302.

ART H 303. *Art in the Seventeenth Century.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the early Baroque in Europe. Note: Formerly part of ART 402.

ART H 304. *Canadian Art I.* ★3 (either term, 3-0-0). The history of painting, sculpture and architecture from the seventeenth century to the end of the nineteenth century in Canada. Note: Formerly part of ART 304.

ART H 305. *Nineteenth Century Art I.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the first half of the nineteenth century in Europe. Note: Formerly part of ART 400.

ART H 306. *Twentieth Century Art I.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the first half of the twentieth century. Note: Formerly part of ART 401.

ART H 307. *History of Design I.* ★3 (either term, 3-0-0). The history of the design and ornamentation of useful objects in the Western European tradition up to the industrial revolution. Note: Formerly part of ART 309.

ART H 350. *East Asian Art II.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of Japan from archaic time to Edo. Note: Formerly part of ART 303.

ART H 351. *Medieval Art II.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the later Middle Ages (eleventh to fifteenth centuries) in Europe. Note: Formerly part of ART 301.

ART H 352. *Renaissance Art II.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the sixteenth century in Europe. Note: Formerly part of ART 302.

ART H 353. *Art in the Eighteenth Century.* ★3 (either term, 3-0-0). The history of the art, architecture, and applied arts of the later Baroque and Rococo in Europe. Note: Formerly part of ART 402.

ART H 354. *Canadian Art II.* ★3 (either term, 3-0-0). The history of painting, sculpture and architecture of the twentieth century in Canada. Note: Formerly part of ART 304.

ART H 355. *Nineteenth Century Art II.* ★3 (either term, 3-0-0). The history of the art, architecture and applied arts of the second half of the nineteenth Century in Europe. Note: Formerly part of ART 400.

ART H 356. *Twentieth Century Art II.* ★3 (either term, 3-0-0). The history of the art, architecture and applied arts of the second half of the twentieth century. Note: Formerly part of ART 401.

ART H 357. *History of Design II.* ★3 (either term, 3-0-0). The history of the design and ornamentation of useful objects since the industrial revolution. Note: Formerly part of ART 309.

ART H 404. *Aspects of Early Canadian Art.* ★3 (either term, 0-3s-0). Prerequisite: ART H 304 or consent of the Department. Note: Formerly part of ART 404/406.

ART H 405. *Aspects of Art from the First Half of the Nineteenth Century.* ★3 (either term, 0-3s-0). Neo-Classicism, Romanticism, Realism, Pre-Raphaelitism, etc. Prerequisite: ART H 305 or consent of the Department. Note: Formerly part of ART 406.

ART H 406. *Aspects of Art from the Beginning of the Twentieth Century.* ★3 (either term, 0-3s-0). Cubism, Constructivism, Suprematism, Surrealism, Dada, etc. Prerequisite: ART H 306 or consent of the Department. Note: Formerly part of ART 406.

ART H 407. *Aspects of Design in the Nineteenth Century.* ★3 (either term, 0-3s-0). Theories of Design, Functionalism and Ornament, The Arts and Crafts Movement, Design and Mechanization, etc. Prerequisite: ART H 357 or consent of the Department. Note: Formerly part of ART 409.

ART H 408. *Special Topics I.* ★3 (either term, 0-3s-0). Topics other than those listed in 400-level courses. Prerequisite: Consent of the Department. Note: Formerly part of ART 403/404/405.

ART H 409. *Bibliography and Methods.* ★3 (either term, 0-3s-0). Research techniques used in the History of Art and Design. Prerequisite: Consent of the Department. Note: Formerly part of ART 409.

ART H 450. *Aspects of Museology.* ★3 (either term, 0-3s-0). Discussion and practical study of museum operation from the point of view of the art historian and curator, including care, preservation, and display of works of art. Prerequisites: two senior ART H courses and consent of the Department. Note: Formerly part of ART 407.

ART H 454. *Aspects of Twentieth Century Canadian Art.* ★3 (either term, 0-3s-0). Regionalism, Landscape, Abstraction ism. Prerequisite: ART H 354 or consent of the Department Note: Formerly part of ART 406.

ART H 455. *Aspects of Art from the Second Half of the Nineteenth Century.* ★3 (either term, 0-3s-0). Impressionism Neo-Impressionism, Symbolism, Art Nouveau, etc Prerequisite: ART H 355 or consent of the Department. Note Formerly part of ART 406.

ART H 456. *Aspects of Art from the Second Half of the Twentieth Century.* ★3 (either term, 0-3s-0). Abstract Expressionism Pop Art, Kinetic Art, Conceptual Art, Color Field painting, etc Prerequisite: ART H 356 or consent of the Department. Note Formerly part of ART 406.

ART H 457. *Aspects of Design in the Twentieth Century.* ★3 (either term, 0-3s-0). Machine Aesthetics, Art Nouveau, etc Prerequisite: ART H 357 or consent of the Department. Note Formerly part of ART 406.

ART H 459. *Directed Readings in the History of Art and Design.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A directed reading course designed to satisfy special needs of advanced Honors students and others, not otherwise met by annual course offerings. Prerequisite: Consent of the Department.

ART H 503. *Topics in Iconography.* ★3 (either term, 0-3s-0). Iconographical themes used in the art of the fifteenth to the nineteenth centuries. Note: For Art History honors students, and others with consent of the Department.

ART H 505. *Topics in Art from the First Half of the Nineteenth Century.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 509.

ART H 506. *Topics in Art from the First Half of the Twentieth Century.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 500/502.

ART H 507. *Topics in Nineteenth Century Design.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 500/509.

ART H 508. *Special Topics II.* ★3 (either term, 0-3s-0). Topics other than those listed in 500-level courses. Prerequisite: Consent of the Department. Note: Formerly part of ART 309/409/509.

ART H 555. *Topics in Art from the Second Half of the Nineteenth Century.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 500.

ART H 556. *Topics in Art from the Second Half of the Twentieth Century.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 500/502.

ART H 557. *Topics in Twentieth Century Design.* ★3 (either term, 0-3s-0). Intended for advanced honors students. Prerequisite: Consent of the Department. Note: Formerly part of ART 500/509.

ART H 558. *Studies in the Relationship of the Visual Arts and Literature.* ★3 (either term, 3-0-0). Topics in the history of art studied with particular reference to the interaction of the visual arts (painting, sculpture, architecture) with international literature. Prerequisites: One senior-level Art History course, one senior-level course in literature, and reading knowledge of one relevant language other than English. Corequisite: C LIT 504.

ART H 559. *Directed Readings in the History of Art and Design.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A directed reading course designed to satisfy special needs of advanced honors students and others, not otherwise met by annual course offerings. Prerequisite: Consent of Department.

44.5.4 SENIOR COURSES IN STUDIO

ART 312. *Painting.* ★6 (2-0-4). Introduction to the principles and techniques of painting. Prerequisite: ART 231, or 232, and consent of the Department.

ART 313. *Painting.* ★6 (2-0-4). Individual directed study for students wishing to specialize in painting. Prerequisite or corequisite: ART 312 and consent of the Department.

ART 322. *Printmaking.* ★6 (2-0-4). Introduction to the principles and technical applications of printmaking including a study of Intaglio, Relief, Silkscreens, and Lithography. Prerequisite: ART 231, or 232, and consent of the Department.

ART 323. *Printmaking.* ★6 (2-0-4). Further study of the principles and technical applications of printmaking related to Intaglio, Relief, Silkscreen, and Lithography. Prerequisite or corequisite: ART 322 and consent of the Department.

ART 339. *Special Projects in Studio Disciplines.* ★6 (2-0-4). A course intended to meet the special needs of students not otherwise satisfied under existing regulations in regular course offerings. Prerequisite: Consent of the Department.

ART 340. *Drawing.* ★3 (either term, 2-0-4). Development and application of techniques and concepts of drawing. Note: Restricted to B.F.A. students.

ART 362. *Sculpture.* ★6 (2-0-4). Foundation studies in sculpture. Prerequisite: ART 231, or 232, and consent of the Department.

ART 363. *Sculpture.* ★6 (2-0-4). Further foundation studies in sculpture. Prerequisite or corequisite: ART 362 and consent of the Department.

ART 368. *Introduction to Studio.* ★3 (First Term, 2-0-4). Directed study in one subject embraced by ART 312, 322, 362, 372, 392. Prerequisite: ART 231, or 232, and consent of the Department. Note: Restricted to students in the Faculty of Education only.

ART 372. *Industrial Design.* ★6 (2-0-4). Foundation studies in three-dimensional design. Prerequisite: ART 231 or 232, and consent of the Department.

ART 373. *Industrial Design.* ★6 (2-0-4). Further foundation studies in three-dimensional design. Prerequisite or corequisite: ART 372 and consent of the Department.

ART 382. *Visual Aspects of Film and Video.* ★6 (2-0-4). A theoretical and practical study of the visual, aesthetic, and expressive capabilities of kinetic images and their production within the context of visual fundamentals and visual communication design. Prerequisite: ART 231, or 232, and consent of the Department.

ART 392. *Visual Communication Design.* ★6 (2-0-4). Introduction to the study and practice of design principles and techniques, mainly in two-dimensional media. Prerequisite: Normally, ART 231, or 232, and / or consent of the Department.

ART 393. *Visual Communication Design.* ★6 (2-0-4). Study and practice of design principles and techniques in photography and typography. Prerequisite or corequisite: Normally, ART 392 and / or consent of the Department.

ART 412. *Painting.* ★6 (2-0-4). Further study of the principles and techniques of painting. Prerequisite: Normally, ART 312 and consent of the Department.

ART 413. *Painting.* ★6 (2-0-4). Directed individual study for students wishing to specialize further in painting. Students will be encouraged to explore both contemporary and traditional mediums. Prerequisite or corequisite: Normally, ART 412 and consent of the Department.

ART 414. *Projects in Painting.* ★6 (2-0-4). A specialized course for students concentrating in painting. Prerequisite: Consent of the Department.

ART 422. *Printmaking.* ★6 (2-0-4). Directed individual study of the principles and technical applications of printmaking. Choice of study from three of the following: Intaglio, Relief, Silkscreen, and Lithography. Prerequisite: ART 322 and consent of the Department.

ART 423. *Printmaking.* ★6 (2-0-4). Further directed individual study of principles and technical applications of printmaking in three of the following: Intaglio, Relief, Silkscreen and Lithography. Prerequisite or corequisite: ART 422 and consent of the Department.

ART 424. *Printmaking.* ★6 (2-0-4). Additional directed individual study of the principles, and traditional and contemporary technical applications of printmaking in three of the following: Relief, Silkscreen, Intaglio, and Lithography. Prerequisite or corequisite: ART 423 and consent of the Department.

ART 439. *Special Projects in Studio Disciplines.* ★6 (2-0-4). Special projects in studio disciplines by special arrangement with the Department. Prerequisite: Consent of the Department.

ART 440. *Drawing.* ★6 (2-0-4). Further study and application of the techniques and concepts of drawing. Note: Restricted to B.F.A. students.

ART 462. *Sculpture.* ★6 (2-0-4). Intermediate studies in sculpture. Prerequisite: Normally, ART 362 and consent of the Department.

ART 463. *Sculpture.* ★6 (2-0-4). Further intermediate studies in sculpture. Prerequisite or corequisite: Normally, ART 462 and consent of the Department.

ART 464. *Sculpture.* ★6 (2-0-4). Additional intermediate studies in sculpture. Prerequisite or corequisite: ART 463 and consent of the Department.

ART 472. *Industrial Design.* ★6 (2-0-4). Intermediate study of industrial design principles. Prerequisite: ART 372 and consent of the Department.

ART 473. *Industrial Design.* ★6 (2-0-4). Further intermediate studies of industrial design principles. Prerequisite or corequisite: ART 472 and consent of the Department.

ART 474. *Industrial Design.* ★6 (2-0-4). Additional intermediate studies of industrial design principles. Prerequisite or corequisite: ART 473 and consent of the Department.

ART 492. *Visual Communication Design.* ★6 (2-0-4). Intermediate study and practice of design principles and techniques in graphic design including photography, typography, and illustration. Prerequisite: Normally, ART 392 and / or consent of the Department.

ART 493. *Visual Communication Design.* ★6 (2-0-4). Further intermediate study and practice of design principles and techniques with emphasis on photographic media. Prerequisite or corequisite: Normally, ART 492 and / or consent of the Department.

ART 494. *Visual Communication Design.* ★6 (2-0-4). Additional intermediate study and practice of design principles and techniques with emphasis on typographic media. Prerequisite or corequisite: Normally, ART 492 and / or consent of the Department.

ART 512. *Painting.* ★6 (2-0-4). Advanced study of the principles and techniques of painting. Prerequisite or corequisite: Normally, ART 412 and consent of the Department.

ART 513. *Painting.* ★6 (2-0-4). Individual directed study for students wishing to specialize further in painting at an advanced level. Prerequisite or corequisite: Normally, ART 512 and consent of the Department.

ART 514. *Projects in Painting.* ★6 (2-0-4). A specialized course for advanced students concentrating in painting. Prerequisite: Normally, consent of the Department.

ART 522. *Printmaking.* ★6 (2-0-4). Advanced individual study of the principles and technical applications of printmaking in two of the following: Intaglio, Relief, Silkscreen, and Lithography. Prerequisite: ART 422 and consent of the Department.

ART 523. *Printmaking.* ★6 (2-0-4). Further individual study at an advanced level of the principles and technical applications of printmaking in two of the following: Intaglio, Relief, Silkscreen, and Lithography. Prerequisite or corequisite: ART 522 and consent of the Department.

ART 524. *Printmaking.* ★6 (2-0-4). Additional individual study at an advanced level of the principles and traditional and contemporary technical applications of printmaking in two of the following: Intaglio, Relief, Silkscreen, and Lithography. Prerequisite or corequisite: ART 523 and consent of the Department.

ART 539. *Special Projects in Studio Disciplines.* ★6 (2-0-4). Special projects in studio disciplines, by special arrangement with the Department. Prerequisite: Consent of the Department.

ART 562. *Sculpture.* ★6 (2-0-4). Advanced studies in sculpture. Prerequisite: Normally, ART 462 and consent of the Department.

ART 563. *Sculpture.* ★6 (2-0-4). Further advanced studies in sculpture. Prerequisite or corequisite: Normally, ART 562 and consent of the Department.

ART 564. *Sculpture.* ★6 (2-0-4). Additional advanced studies in sculpture. Prerequisite or corequisite: Normally, ART 563 and consent of the Department.

ART 572. *Industrial Design.* ★6 (2-0-4). Advanced studies in the practice of industrial design. Prerequisite: ART 472 and consent of the Department.

ART 573. *Industrial Design.* ★6 (2-0-4). Further advanced studies of the practice of industrial design. Prerequisite or corequisite: ART 572 and consent of the Department.

ART 574. *Industrial Design.* ★6 (2-0-4). Additional advanced studies in the practice of industrial design. Prerequisite or corequisite: ART 573 and consent of the Department.

ART 592. *Visual Communication Design.* ★6 (2-0-4). Advanced study of design principles and techniques in graphic design including aspects of motion. Projects include application of graphic design to real-life situations. Prerequisites: Normally, ART 492, and 493, or 494, and consent of the Department.

ART 593. *Visual Communication Design.* ★6 (2-0-4). Further advanced study of design principles and techniques in photographic media. Applied and expressive modes are explored. Prerequisites: ART 493, 592, and consent of the Department.

ART 594. *Visual Communication Design.* ★6 (2-0-4). Further advanced study of design principles and techniques in typographic media. Applied and experimental modes are explored. Prerequisites: Normally, ART 494, 592, and consent of the Department.

44.5.5 GRADUATE COURSES IN THE HISTORY OF ART AND DESIGN

ART H 605. *Studies in Nineteenth Century Art I.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 606. *Studies in Twentieth Century Art I.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 607. *Studies in Design I.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 608. *Special Topics III.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 609. *Topics in Iconography.* ★3 (either term, 0-3s-0).

ART H 655. *Studies in Nineteenth Century Art II.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 656. *Studies in Twentieth Century Art II.* ★3 (either term, 0-3s-0). Note: Formerly part of ART602.

ART H 657. *Studies in Design II.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 658. *Special Topics IV.* ★3 (either term, 0-3s-0). Note: Formerly part of ART 602.

ART H 659. *Directed Readings in Art and Design.* ★6 (0-3s-0). Note: Formerly part of ART 602.

44.5.6 GRADUATE COURSES IN STUDIO

ART 612. *Painting: concepts, analysis, and criticism.* ★12 (First Term, 0-3s-18).

ART 613. *Painting: development of concepts, analysis, and criticism.* ★12 (Second Term, 0-3s-18).

ART 622. *Printmaking: concepts, analysis, and criticism.* ★12 (First Term, 0-3s-18).

ART 623. *Printmaking: development of concepts, analysis, and criticism.* ★12 (Second Term, 0-3s-18).

ART 630. *Seminar in Related Disciplines.* ★3 (either term, 0-1s-0).

ART 662. *Sculpture: concepts, analysis, and criticism.* ★12 (First Term, 0-3s-18).

ART 663. *Sculpture: development of concepts, analysis, and criticism.* ★12 (Second Term, 0-3s-18).

ART 672. *Industrial Design.* ★10 (First Term, 0-2s-16).

ART 673. *Industrial Design.* ★10 (Second Term, 0-2s-16).

ART 675. *Industrial Design.* ★3 (either term, 0-3s-0).

ART 692. *Visual Communication Design.* ★10 (First Term, 0-2s-16).

ART 693. *Visual Communication Design.* ★10 (Second Term, 0-2s-16).

ART 695. *Visual Communication Design.* ★3 (either term, 0-3s-0).

44.6 Canadian Studies

44.6.1 SENIOR COURSES

CANST 300. *The Politics of the Arts in Canada.* ★6 (3-0-0). A comparative study of the public and private cultural organization and its effect on the development of the arts in Canada. Prerequisite: Open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.

CANST 301. *Canadian Intellectual Traditions: 1800-1960.* ★6 (1-2s-0). An interdisciplinary comparison of recurring intellectual themes and issues which define the structure of the Canadian nation from regional points of view. Prerequisites: Reading competence in French and one full-course equivalent from two of the following disciplines: 1) ENGL 384, or two of ENGL 364, 367, 369, 370, 371, 2) ECON 316/317, 318/319, 3) FR CA 332/333 (formerly 331), 4) HIST 278/279, 5) POL S 320 or 321, 6) C LIT 371, 372, 471. Note: This course is open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.

CANST 400. *Contemporary Canadian Issues.* ★6 (0-3s-0). Aspects of political, social, economic, and cultural change in Canada. An interdisciplinary examination of selected political, economic, social, and cultural problems facing Canada at the present time. Note: Open to students in the Canadian Studies Program and to others upon consent of the Canadian Studies Committee.

CANST 401. *Seminar in Canadian Studies.* ★3 (First Term, 0-3s-0). Note: Open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.

CANST 402. *Seminar in Canadian Studies.* ★3 (Second Term, 0-3s-0). Note: Open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.

44.7 Chinese

Department of History

44.7.1 JUNIOR COURSE

CHINA 100. *Introductory Modern Standard Chinese.* ★6 (First Term, 0-10L-0). Prerequisite: Consent of Department. Note: Designed for students whose first language is not Chinese.

44.7.2 SENIOR COURSES

CHINA 300. *Basic Integrated Modern Standard Chinese.* ★6 (Second Term, 0-10L-0). Emphasis on reading, writing, and oral/aural skills. Prerequisite: CHINA 100 or consent of Department. Note: Designed for students whose first language is not Chinese.

CHINA 301. *Intermediate Modern Standard Chinese Language I.* ★3 (First Term, 3-0-2). Prerequisite: CHINA 300 or consent of the Department. Note: Designed for students whose first language is not Chinese.

CHINA 302. *Intermediate Modern Standard Chinese Language II.* ★3 (Second Term, 3-0-2). Prerequisite: CHINA 301 or consent of Department. Note: Designed for students whose first language is not Chinese.

CHINA 311. *Modern Standard Chinese for Those Proficient in Other Dialects I.* ★3 (First Term, 3-0-1). This course is designed for speakers proficient in one of the regional dialects of Chinese to gain fluency in the standard language. Prerequisite: Proficiency in any of the regional dialects of China.

CHINA 312. *Modern Standard Chinese for Those Proficient in Other Dialects II.* ★3 (Second Term, 3-0-1). Continuation of CHINA 311. Prerequisite: CHINA 311.

CHINA 321. *Early Chinese Literature in Translation.* ★3 (First Term 3-0-0). Chinese literature to 1920.

CHINA 322. *Modern Chinese Literature in Translation.* ★3 (Second Term, 3-0-0). Chinese literature since 1920.

CHINA 325. *Calligraphy I.* ★3 (either term, 3-0-0). Introduction to the history of the Chinese and Japanese written languages and to basic vocabulary through brush writing and reading. Note: CHINA 325 and JAPAN 325 may not both be taken for credit. This course is designed for students whose first language is not Chinese.

CHINA 326. *Calligraphy II.* ★3 (either term, 3-0-0). Study of historical changes in style and usage of characters through brush writing and reading. Prerequisite: CHINA 325 or JAPAN 325 or consent of Department. Note: CHINA 326 and JAPAN 326 may not both be taken for credit. This course is designed for students whose first language is not Chinese.

CHINA 341. *Literary Chinese I.* ★3 (either term, 3-0-0). An introduction to the syntactic, lexical and stylistic forms used in classical Chinese. Prerequisite: CHINA 302.

CHINA 342. *Literary Chinese II.* ★3 (either term, 3-0-0). A continuation of CHINA 341. Prerequisite: CHINA 341.

CHINA 401. *Advanced Modern Standard Chinese I.* ★3 (either term, 3-0-0). Equal emphasis on oral and written work in the modern colloquial medium. Prerequisites: CHINA 301/302 or equivalent.

CHINA 402. *Advanced Modern Standard Chinese II.* ★3 (either term, 3-0-0). Continuation of CHINA 401. Prerequisite: CHINA 401.

CHINA 403. *Advanced Readings in Modern Chinese I.* ★3 (First Term, 3-0-0). Guided readings from Mao, Lu Xun, Lao She and

other writers since 1919. Prerequisite: Consent of Department.

CHINA 404. *Advanced Readings in Modern Chinese II.* ★3 (Second Term, 3-0-0). Guided reading from Ren Min Ri Bao and other twentieth century periodicals. Prerequisite: Consent of Department.

CHINA 441. *Intermediate Literary Chinese I.* ★3 (First Term, 3-0-0). Advanced syntax of classical Chinese and readings from classical texts. Prerequisite: CHINA 342 or consent of Department.

CHINA 442. *Intermediate Literary Chinese II.* ★3 (Second Term, 3-0-0). A continuation of CHINA 441. Prerequisite: CHINA 441.

CHINA 451. *Topics in Early Fiction.* ★3 (either term, 3-0-0). A critical analysis of form and themes in pre-Republican prose. Prerequisite: Consent of Department.

CHINA 452. *Topics in Modern Literature.* ★3 (either term, 3-0-0). A critical study of topics chosen from contemporary prose, poetry, and drama. Prerequisite: Consent of Department.

CHINA 453. *Topics in Early Drama.* ★3 (either term, 3-0-0). A critical study of some major plays from the Yuan, Ming and Ch'ing periods. Prerequisite: Consent of Department.

CHINA 454. *Topics in Early Poetry.* ★3 (either term, 3-0-0). A critical study of form and meaning in classical Chinese poetry. Prerequisite: Consent of Department.

CHINA 481. *Supervised Reading in Chinese I.* ★3 (either term, 3-0-4). Accelerated reading course primarily for senior or graduate students for special areas of need or interest. Prerequisite: Written consent of Department.

CHINA 482. *Supervised Reading in Chinese II.* ★3 (either term, 3-0-4). Further accelerated reading for senior and graduate students. Prerequisite: Written consent of Department.

CHINA 581. *Supervised Study in the Chinese Language I.* ★3 (either term, 3-0-4). Prerequisite: Written consent of Department.

CHINA 582. *Supervised Study in the Chinese Language II.* ★3 (either term, 3-0-4). Prerequisite: Written consent of Department.

44.8 *Christian Theology*

(from within the Roman Catholic tradition)
St. Joseph's College

The following courses are offered by St. Joseph's College and are accepted for credit in programs offered in the Faculty of Arts.

CHR T 266. *The Beginning of the Church.* ★3 (First Term, 3-0-0). A study of the early Christian Church, with special attention to the *Acts of the Apostles,* the earliest proclamation of the Christian faith, the formation of the Gospels, Paul's teaching on the Christian life.

CHR T 272. *Introduction to Catholic Moral Thought.* ★3 (Second Term, 3-0-0). The role of reason, Sacred Scripture, tradition, the Church, and individual freedom and responsibility in the formation and exercise of conscience.

CHR T 342. *The Early Papacy.* ★3 (either term, 3-0-0). An historical study of the establishment of the Papacy and its development until the formation of the Papal states in the eighth century.

CHR T 343. *The Medieval Papacy.* ★3 (either term, 3-0-0). The Popes and the Papal institution from the time of Charlemagne till the Council of Trent in the sixteenth century.

CHR T 344. *Catholicism: Late Middle Ages to Modern Times.* ★3 (Second Term, 3-0-0). The history of the Church, its beliefs and theology, its struggles with reformers and nation states, from the days of schism to ecumenism.

CHR T 346. *The Churches in Europe in the Nineteenth Century.* ★3 (First Term, 3-0-0). Major Christian denominations in Europe from the French Revolution to 1900. Their struggle with revolution, secularism, liberalism, nationalism, and scientism, the Papal States, problems of biblical authority, the crisis of faith, missionary expansion, and spiritual phenomena. Reference is made to Anglican, Catholic, and Protestant Churches.

CHR T 347. *The Churches in Europe in the Twentieth Century.* ★3 (Second Term, 3-0-0). The Churches, socialism, anti-semitism, the dilemma of war; the rise of totalitarianism: fascism, nazism, and communism; zionism and the holocaust; post-war theologies of politics and pluralism. Emphasis on Catholic, Lutheran and Orthodox churches.

CHR T 349. *Christianity and Social Justice.* ★3 (either term, 3-0-0). Examines particular problems of social justice in the world and in Canada and the alternative solutions offered by contemporary thinkers from a Christian point of view. This course includes Christian social thought, Christian pacifism, theology of politics.

CHR T 351. *The Christian Meaning of Sex and Marriage.* ★3 (either term, 3-0-0). The sexual revolution and its relevance for sexual ethics; premarital sex; marriage breakdown and divorce; sex as a human reality; Christian meaning of marriage.

CHR T 352. *Medical-Moral Problems.* ★3 (either term, 3-0-0). Christian reasons for valuing life; examination from a Christian perspective of euthanasia, abortion, genetic research, sterilization, reproductive technologies, and medical experimentation; rights of patients.

CHR T 362 *Theological Sources.* ★3 (either term, 3-0-0). Theology, as a science, resorts to its basic source, Scripture. An examination of the thought of Christian theologians reflecting on the Old Testament as a source of revelation. Emphasis on the contribution of Christian writers and theologians to the Christian theological heritage.

CHR T 364. *Dimensions of Christian Faith* ★3 (First Term, 3-0-0). A study of Christian faith as a human and religious problem. Biblical views on faith will be examined as well as diverse interpretations of faith within the Christian tradition. Particular problems to be studied: the relationship between faith experiences and human experiences as such; the relationship between authority and freedom; individual faith and the faith of a community; faith and culture; the possibility of Christian faith today.

CHR T 366. *New Testament Themes.* ★3 (Second Term, 3-0-0). A study of the meanings attributed to Jesus Christ in the New Testament. The problem of the formation of the Gospels will be examined and particular attention given to the images of Jesus Christ presented by the principal authors of the New Testament. Efforts to relate the Biblical Christ to contemporary culture will also be studied.

CHR T 370. *Comtemporary Theology of the Catholic Church.* ★3 (Second Term, 3-0-0). What does it mean to be a Catholic Christian in the modern world? What is expected of the Christian? What is the Christian? What is the Christian to become? A study of contemporary ecclesiological themes, in light of the needs of modern man and modern youth.

CHR T 372. *The Eucharist in Christian Worship.* ★3 (First Term, 3-0-0). A theological study of the development of Catholic liturgy from the Jewish foundation to the present day. A study of the Eucharist both as sacrifice and as sacrament. Contemporary theological developments in the liturgy both in theory and practice.

CHR T 374. *Great Minds of Early Christianity.* ★3 (First Term, 3-0-0). Developments in Christian thought during the period of the Apostolic Fathers. Formulation of the creeds. Early encounters of Christianity with the philosophical and religious thought of the ancient world.

CHR T 376. *The Evolution of Christian Thought.* ★3 (Second Term, 3-0-0). An historical survey of the evolution of Catholic thought with emphasis on the readings of some of the great Christian thinkers.

CHR T 379. *Theology and Liturgy of Eastern Christian Churches in Communion with Rome.* ★3 (Second Term, 3-0-0). An introduction to the theology and liturgy of Eastern Christianity in communion with Rome with special attention to the Ukrainian Church.

CHR T 380. *Catechetics I.* ★3 (either term, 3-0-0). Problems which catechetics faces today, with emphasis on the analysis of basic religious experience in the meeting of God and man in Scripture, in Christ, liturgy and doctrine. Note: Formerly part of CHR T 378. Not open for credit to students with credit in CHR T 378.

CHR T 381. *Catechetics II.* ★3 (Second Term, 3-0-0). Brief survey of the history of catechetics and of contemporary schools of catechetics. An analysis of religious experience and contemporary secularization, and of religious experience and the witness of the individual in the moral life. Prerequisite: CHR T 380. Note: Formerly part of CHR T 378. Not open for credit to students with credit in CHR T 378.

CHR T 410. *Modern Catholic Theology.* ★3 (either term, 3-0-0). An exploration of the efforts of one or several recent or con-

temporary Roman Catholic theologians to express Christian doctrine in ways intelligible to the modern world. Prerequisites: Two previous courses in Christian theology or permission of College.

CHR T 411. *Seminar in Ecumenism.* ★3 (Second Term, 3-0-0). An examination of the Protestant-Catholic-Orthodox dialogues in the twentieth century and the efforts to recover the unity-within-diversity of Christianity. Prerequisites: Two previous courses in Christian Theology or permission of the College.

For Philosophy courses offered by St. Joseph's College, see §44.29.4. For other information see § 246.1.2 of the University Regulations and Information for Students Calendar.

44.9 Classics

Note: All 200 and 300-level courses under this heading are survey courses designed primarily for the non-specialist and may be taken by students with no knowledge of Greek or Latin.

For additional related courses see § § 44.18 and 44.25.

44.9.1 JUNIOR COURSES

CLASS 201. *Literature of Greece and Rome.* ★3 (either term, 3-0-0). An introductory survey in English translation of Greek and Latin literature in its social, artistic, and cultural background. A limited number of major works, representing the most important genres, will be studied. May not be taken concurrently with or subsequent to CLASS 359/362.

CLASS 202. *Greek and Roman Mythology.* ★3 (either term, 3-0-0). A survey of classical mythology with readings in translation from various ancient authors as well as from modern scholarly works. Note: Formerly part of CLASS 240.

CLASS 230. *Introduction to the Ancient Near East and Greece.* ★3 (either term, 3-0-0). An introductory course in the history of the Ancient Near East and Greece from the Neolithic Age to the fourth century A.D. Note: May not be taken concurrently with or subsequent to CLASS 363/364.

CLASS 231. *Introduction to Rome and the West.* ★3 (either term, 3-0-0). An introductory course in the history of Rome and the Western Mediterranean to the collapse of the Roman Empire. Note: May not be taken concurrently with or subsequent to CLASS 365/366 and 371/372.

CLASS 241. *Ancient Science and Technology.* ★3 (either term, 3-0-0). A survey of ancient science and technology in the Middle Eastern, Greek, and Roman civilizations.

CLASS 250. *The Greek World.* ★3 (either term, 3-0-0). Greek life and society illustrated by archaeological discoveries; the Bronze Age, the city, temples, Athens, Sparta, Greek art and architecture, trade, and warfare. Slides, films, and other materials.

CLASS 251. *The Roman World.* ★3 (either term, 3-0-0). A study of Roman society illustrated by archaeological discoveries; city life, housing, town planning, games, trade, shipping, and the army. Slides, films, coins, other materials. Note: Formerly a full-session course.

CLASS 260. *Greek and Latin Etymology.* ★3 (either term, 3-0-0). A study of Greek and Latin words commonly used in English: how these words are built, and how they gain and change in meanings.

44.9.2 SENIOR COURSES

CLASS 351. *Latin Literature in Translation.* ★3 (either term, 3-0-0). A survey, in translation, of classical Latin authors, seen in the context of social and cultural history. Note: Formerly part of CLASS 361/362.

CLASS 357. *Classical Myth and Religion.* ★3 (either term, 3-0-0). The background and origin of classical mythology and religion; Mycenean and Near Eastern sources; religious festivals and usages; modern scholarship.

CLASS 359. *Greek Literature in Translation I.* ★3 (First Term, 3-0-0). Greek literature studied within the context of ancient Greek civilizations; will include Homer, Hesiod, lyric poetry, Aeschylus, and Sophocles.

CLASS 360. *Greek Literature in Translation II.* ★3 (Second Term, 3-0-0). A continuation of the study of Greek literature within the context of ancient Greek civilization; will include Sophocles, Euripides, Aristophanes, the historians, and the philosophers.

CLASS 363. *History of Ancient Greece I.* ★3 (First Term, 3-0-0). The Hellenic world from its beginnings in the Bronze Age until the Persian Wars, with special attention to the organization of the city state, Sparta, and the rise of Athenian democracy.

CLASS 364. *History of Ancient Greece II.* ★3 (Second Term, 3-0-0). The Hellenic world from the Persian Wars, through its greatest period and the Peloponnesian War, to the death of Alexander the Great.

CLASS 365. *History of the Roman Republic I.* ★3 (First Term, 3-0-0). The Roman Republic from its beginnings down to 133 B.C., with special attention to social, economic, and constitutional development and the conquest of the Mediterranean.

CLASS 366. *History of the Roman Republic II.* ★3 (Second Term, 3-0-0). The failure of the Roman Republic (133-44 B.C.) considered in the light of imperial expansion in the Mediterranean, with special attention to the careers of Marius, Sulla, Pompey, and Julius Caesar.

CLASS 367. *History of Greek Art I.* ★3 (First Term, 3-0-0). The rise and progress from the Cretan period: architecture and early sculpture.

CLASS 368. *History of Greek Art II.* ★3 (Second Term, 3-0-0). Sculpture from the Classical period to the Graeco-Roman Age; Painting.

CLASS 369. *Early Civilizations I.* ★3 (First Term, 3-0-0). A survey of the beginnings and development of civilization in the Near East, including Sumer, Babylon, Assyria, and the Hebrews.

CLASS 370. *Early Civilizations II.* ★3 (Second Term, 3-0-0). The development of civilization in the western half of the Fertile Crescent, including the rise and decline of the Egyptian, Hittite, and Phoenician cultures.

CLASS 371. *History of the Roman Empire I.* ★3 (First Term, 3-0-0). The Roman Empire from Augustus to the end of the first century A.D.

CLASS 372. *History of the Roman Empire II.* ★3 (Second Term, 3-0-0). The Roman Empire from the beginning of the second century A.D. to the death of Constantine.

CLASS 375. *History of Medicine in the Ancient World.* ★3 (either term, 3-0-0). A survey of medical science from Prehistoric times through Egyptian, Mesopotamian, Greek, and Roman times to the end of the Roman Empire.

CLASS 379. *Greek and Roman Epic.* ★3 (either term, 0-3s-0). A study in English translation of representative works of oral and literary epic from Homer to Lucan.

CLASS 380. *Greek and Roman Tragedy.* ★3 (either term, 0-3s-0). A study of classical tragedy from Aeschylus to Seneca in English translation.

CLASS 459. *Roman Archaeology and Civilization.* ★6 (5-0-15). A study of the old city of Rome, with lecturing trips to Etruria, Ostia, Terracina, Palestrina, Tivoli, Pompeii, Herculaneum, Cumae, and the Greek temples of Paestum. Designed to provide a richer understanding of Latin literature and Roman history and an introduction to advanced studies in Latin literature and Roman history and archaeology. Prerequisite: One university level course in History, Latin or Classics and consent of the Department. Note: This course is given in Rome during the Summer Session only.

44.9.3 ADVANCED COURSES

The following courses are designed for third-year, Honors, and graduate students. The precise topics covered in any given course may vary from year to year. Some account, therefore, may be taken of the particular interests of students within the framework of the course. Normally students who take these courses are expected to have at least one senior course in Ancient History or Literature; if they do not, they must obtain the consent of the Department to their registration, and the Department will consider their special needs.

CLASS 461. *Topics in Roman Imperial History I.* ★3 (First Term, 0-3s-0).

CLASS 462. *Topics in Roman Imperial History II.* ★3 (Second Term, 0-3s-0).

CLASS 463. *Topics in Roman Republican History I.* ★3 (First Term, 0-3s-0).

CLASS 464. *Topics in Roman Republican History II.* ★3 (Second Term, 0-3s-0).

CLASS 465. *Topics in Hellenistic History I.* ★3 (First Term, 0-3s-0).

CLASS 466. *Topics in Hellenistic History II.* ★3 (Second Term, 0-3s-0).

CLASS 467. *Topics in Early Greek History I.* ★3 (First Term, 0-3s-0).

CLASS 468. *Topics in Early Greek History II.* ★3 (Second Term, 0-3s-0).

CLASS 469. *Topics in Classical Greek History I.* ★3 (First Term, 0-3s-0).

CLASS 470. *Topics in Classical Greek History II.* ★3 (Second Term, 0-3s-0).

CLASS 471. *Regional Studies in Ancient History I.* ★3 (First Term, 0-3s-0).

CLASS 472. *Regional Studies in Ancient History II.* ★3 (Second Term, 0-3s-0).

CLASS 473. *Topics in Greek and Italian Archaeology I.* ★3 (First Term, 0-3s-0).

CLASS 474. *Topics in Greek and Italian Archaeology II.* ★3 (Second Term, 0-3s-0).

CLASS 475. *Practical Methods in Classical Archaeology.* ★3 or ★6 (0-10L-0). The techniques of excavation and recording in Classical Archaeology. Prerequisite: Consent of the Department. Note: Offered only for field work in the archaeology of the Greek and Roman world and restricted to those participating in an excavation sponsored by the Department.

CLASS 481. *Greek and Latin Epic I.* ★3 (First Term, 0-3s-0).

CLASS 482. *Greek and Latin Epic II.* ★3 (Second Term, 0-3s-0).

CLASS 483. *Greek and Roman Tragedy I.* ★3 (First Term, 0-3s-0).

CLASS 484. *Greek and Roman Tragedy II.* ★3 (Second Term, 0-3s-0).

CLASS 485. *Greek and Roman Comedy I.* ★3 (First Term, 0-3s-0).

CLASS 486. *Greek and Roman Comedy II.* ★3 (Second Term, 0-3s-0).

CLASS 498. *Individual Study of Literary Problems.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

CLASS 499. *Individual Study of Historical Problems.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

CLASS 521. *Ancient History (Comprehensive).* ★6 (0-3s-0).

CLASS 601. *Studies in Greek Archaeology.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

CLASS 602. *Studies in Italian Archaeology.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

44.10 Comparative Literature

44.10.1 JUNIOR COURSES

C LIT 201. *Introduction to World Literature I.* ★3 (either term, 3-0-0). An analysis of a limited number of major works of world literature (in English translations) representing the more important periods and genres from antiquity to the renaissance. Note: Formerly part of C LIT 200. Only one of C LIT 201, and 202, or 301, and 302, or 201, and 302, or 202, and 301 may be taken for credit.

C LIT 202. *Introduction to World Literature II.* ★3 (either term, 3-0-0). An analysis of a limited number of major works of world literature (in English translations) representing the more important periods and genres since the renaissance. Note: Formerly part of C LIT 200. Only one of C LIT 201, and 202, or 301, and 302, or 201, and 302, or 202, and 301 may be taken for credit.

C LIT 271. *Introduction to the Comparative Study of the Canadian Literatures I.* ★3 (First Term, 3-0-0). An introductory course designed to compare the basic texts of English-Canadian and French-Canadian literatures. Note: This course is not intended to replace C LIT 201/202 as a prerequisite for senior courses.

C LIT 272. *Introduction to the Comparative Study of the Canadian Literatures II.* ★3 (Second Term, 3-0-0). An introductory course designed to compare the basic texts of English-Canadian and French-Canadian literatures. Prerequisite: C LIT 271. Note: This course is not intended to replace C LIT 201/202 as a prerequisite for senior courses.

44.10.2 SENIOR COURSES

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). See § 44.22. Accepted as an option, and as a subject of concentration in Honors and B.A. (Special) programs.

INT D 301. *The Hollywood Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

C LIT 301. *Studies in World Literature I.* ★3 (either term, 3-0-0). Major works of world literature, mainly in English translations, representing the more important periods and genres from antiquity to the renaissance. Prerequisite: ENGL 200 or equivalent, or a C LIT 200- or 300-level course. Note: Formerly part of C LIT 300. Only one of C LIT 201, and 202, or 301, and 302, or 201, and 302, or 202, and 301 may be taken for credit.

C LIT 302. *Studies in World Literature II.* ★3 (either term, 3-0-0). Major works of world literature, mainly in English translations, representing the more important periods and genres since the renaissance. Prerequisite: ENGL 200 or equivalent, or a C LIT 200- or 300-level course. Note: Formerly part of C LIT 300. Only one of C LIT 201 and 202, or 301 and 302, or 201 and 302, or 202 and 301 may be taken for credit.

C LIT 340. *Extrinsic Approaches to Literature.* ★6 (3-0-0). Designed to demonstrate, from a literary point of view, the use of extrinsic approaches in the study of literature; the nature of the course is introductory. It would examine such relations as literature and psychology, society and the other arts. Prerequisite: C LIT 201/202, or 301/302, or ENGL 200, or equivalent.

C LIT 344. *The Forms and Analysis of Narrative.* ★3 (First Term, 3-0-0). A systematic survey of the main components of narrative with the major emphasis placed on Continental theories. Prerequisite: ENGL 200 or equivalent.

C LIT 345. *The Forms and Analysis of Poetry.* ★3 (Second Term, 3-0-0). The elements and levels of the poetic text with the major emphasis placed on Continental theories. Prerequisite: ENGL 200 or equivalent.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.) Accepted as an option only.

C LIT 351. *Introduction to the Western Tradition in Literary Criticism I.* ★3 (either term, 3-0-0). An introduction to critical methodology, exercises in practical criticism, and an examination of concepts of literary criticism as drawn from contemporary international critical writings. Prerequisite: ENGL 200 or equivalent, or C LIT 201/202. Note: Formerly part of C LIT 350.

C LIT 352. *Introduction to the Western Tradition in Literary Criticism II.* ★3 (either term, 3-0-0). An international survey of the major developments in Western literary criticism from Aristotle to the present time. Prerequisite: ENGL 200 or equivalent, or C LIT 201/202. Note: Formerly part of C LIT 350.

C LIT 354. *Literature and the Theatre.* ★3 (either term, 3-0-0). International comparative studies in the interrelationship of literature and the theatre. Prerequisite: C LIT 201/202, or 301/302, or ENGL 200, or equivalent. Note: Formerly C LIT 460.

C LIT 355. *Comparative Studies in Traditional and Post-Colonial Literatures I.* ★3 (either term, 3-0-0). Introduction to the comparative study of the literatures of Africa in French and English with respect to their development from their traditional, i.e., oral forms. Some material will be drawn from Asian (i.a., Chinese) and Latin American literatures. Prerequisite: C LIT 201/202, or 301/302, or ENGL 200, or equivalent.

C LIT 356. *Comparative Studies in Traditional and Post-Colonial Literatures II.* ★3 (either term, 3-0-0). The comparative study of the literatures of Africa in French and English with respect to their development from their traditional, i.e., oral forms. Some material will be drawn from Asian (i.a. Chinese) and Latin American literatures. Prerequisite: C LIT 355.

C LIT 358. *Introduction to the Study of Themes and Motifs I.* ★3 (either term, 3-0-0). The study of selected international themes and motifs, their origin, and their literary development. Prerequisite: C LIT 201/202, or ENGL 200, or equivalent. Note: Formerly part of C LIT 360.

C LIT 359. *Introduction to the Study of Themes and Motifs II.* ★3 (either term, 3-0-0). The study of selected international themes and motifs, their origin and their literary development. Prerequisite: C LIT 201/202, ENGL 200, or equivalent. Note: Formerly part of C LIT 360.

C LIT 362. *International Movements in Contemporary Literature.* ★6 (3-0-0). This course is designed to introduce the student to such topics as literature of the absurd, existential literature, and surrealism. Prerequisites: C LIT 201/202, or 301/302, or ENGL 200, or equivalent.

C LIT 364. *Studies in the Concept of Genre.* ★3 (either term, 3-0-0). An introduction to the study of "genre" in an international and historical context. It would examine the development of a specific genre (i.e., the novel) within a theoretical framework. Prerequisite: ENGL 200 or equivalent, or C LIT 201/202, or 301/302.

C LIT 365. *Literature and Society.* ★3 (either term, 3-0-0). International comparative studies on the interrelationship of literature and society, seen from the point of view of literature. Prerequisite: C LIT 201/202, or 301/302, or ENGL 200, or equivalent. Note Formerly C LIT 465.

C LIT 370. *Psychological Theories in the Explication of Literature.* ★3 (either term, 3-0-0). The use of theories, such as those of Freud and Jung to explicate literary texts; examples will be drawn from a variety of literatures. Prerequisite: C LIT 201/202, or 301/302, or ENGL 200, or equivalent. Formerly C LIT 470.

C LIT 371. *Introduction to the Comparative Study of Canadian Poetry.* ★3 (either term, 3-0-0). A systematic introduction to the poetry of Canadian literatures, chiefly French and English, examined on a comparative basis within an international framework. Prerequisites: C LIT 201/202, or 301/302, or ENGL 200, or equivalent; reading knowledge of French.

C LIT 372. *Introduction to the Comparative Study of Canadian Prose.* ★3 (either term, 3-0-0). A systematic introduction to narrative and other forms of prose of Canadian literatures, chiefly French and English, examined on a comparative basis within an international framework. Prerequisites: C LIT 201/202, or 301/302, or ENGL 200, or equivalent; reading knowledge of French.

C LIT 375. *Literature and Music.* ★3 (either term, 3-0-0). An introduction to the international comparative study of the influence of music on literature (individual works, movements, forms, and styles). Prerequisites: C LIT 201/202, or 301/302, or ENGL 200, or equivalent. At least one full-course equivalent in music history covering the area of Medieval, Renaissance, Baroque or Classical, Romantic, Modern, or a combination of these areas. Note: Formerly C LIT 464.

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). See § 44.22. Accepted as an option only.

C LIT 410. *German-French Literary Relations.* ★6 (3-0-0). A survey of German-French and French-German literary relations from the Middle Ages to modern times, emphasizing periods of intense literary exchanges. Prerequisite: Competent reading knowledge of German and French, combined Honors in German-French or consent of the Department.

C LIT 420. *German-English Literary Relations.* ★6 (3-0-0). A survey of German-English and English-German literary relations from the Renaissance to modern times, including nineteenth and twentieth century American-German and German-American relations. Prerequisite: Competent reading knowledge of German, combined Honors in German and English, or consent of the Department.

C LIT 430. *French-English Literary Relations.* ★6 (3-0-0). A survey of French-English and English-French literary relations from the Middle Ages to modern times, emphasizing periods of intense literary exchanges. Prerequisite: Competent reading knowledge of French, combined Honors in French and English, or consent of the Department.

C LIT 440. *French-American Literary Relations.* ★6 (3-0-0). A survey of French-American and American-French literary relations from the eighteenth century to modern times, emphasizing periods of intense literary influences. Prerequisite: Competent reading knowledge of French, combined Honors in French and English, or consent of the Department.

C LIT 450. *Studies in Western European-Slavic Literary Relations.* ★6 (3-0-0). Studies in non-Slavic relations in Slavic literature. Prerequisite: Competent reading knowledge of a Slavic language, combined Honors in Slavic languages and English (or any Germanic or Romance Language), or consent of the Department.

C LIT 455. *The History of Comparative Literature.* ★3 (either term, 3-0-0). An introduction to the major theories and definitions of comparative literature viewed in a historical perspective. Prerequisites: A competent reading knowledge of one relevant language other than English; C LIT 201/202, or 301/302, or ENGL 200 and C LIT 351, or 352, or ENGL 315 or 317, or equivalent.

C LIT 471. *Advanced Comparative Studies in Canadian Literatures.* ★6 (3-0-0). The study of problems in Canadian literatures involving material from more than one literature. Prerequisites: C LIT 201/202, or 301/302, or ENGL 200, or equivalent; reading knowledge of one relevant language other than English.

C LIT 490. *Modern Hebrew Literature in an International Context.* ★6 (3-0-0). Contemporary Hebrew fiction in relation to East European Romantic and realistic writing and to post-symbolist English, American, French, and German literature. The course is usually taught in translation. Prerequisite: Competent reading knowledge of at least one relevant language other than English.

C LIT 495. *Special Topics in Comparative Literary History.* ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 496. *Special Topics in Comparative Literary History.* ★3 (either term, 3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 497. *Special Studies in Comparative Literature.* ★3 (either term, 0-3s-0). Note: Restricted to Honors students.

C LIT 498. *Special Studies in Comparative Literature.* ★6 (0-3s-0). Note: Restricted to Honors students.

44.10.3 HONORS AND GRADUATE COURSES

NOTE: Before registering for these courses, students must consult the Department of Comparative Literature.

C LIT 500. *Literary Scholarship: Methods and Techniques.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Introduction to methods and techniques of literary scholarship and to its theoretical foundations, including bibliographies, style-sheets, and practical methods of research in Comparative Literature. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 504. *Studies in the Relationship of Literature with the Visual Arts.* ★3 (either term, 3-0-0). Topics in the international history and theory of literature studied with particular reference to the interaction with the visual arts (painting, sculpture, architecture) from the point of view of Comparative Literature. Prerequisites: One senior-level course in art history, one senior-level course in literature, and reading knowledge of one relevant language other than English. Corequisite: ART H 558.

C LIT 505. *The Theory of the Study of Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 507. *Literary Stylistics.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A comparative study of the schools and trends of contemporary literary stylistics (psychological, aesthetic, linguistic, quantitative stylistics) together with an analysis of specific stylistic devices on the basis of literary texts. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 510. *Poetics: The Nature and Forms of Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A systematic study of structures of poetry at all levels of the expression and the content (metre, genre, diction, syntax, imagery, topoi, motifs, and specific subject matter) with particular attention to their development and use through the Western tradition, ancient, and modern. Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 511. *Comparative Studies in "Formalistic" Approaches to Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). An introduction to major "formalistic" approaches to literature (e.g., Russian Formalism, Czech Structuralism, Polish Literary Phenomenology, German "Werkimmanente Interpretation", Anglo-American New Criticism, etc.). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 512. *Theory of Translation.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 514. *Poetry and Oral Tradition.* ★3 (either term, 3-0-0). The focus of the course will be on the acquisition of a critical

method to distinguish the oral from the literary tradition by the examination of the oral characteristics of style. Prerequisite: Competent reading knowledge of any relevant ancient or modern language other than English.

C LIT 515. *Studies in Folklore: Prose Forms.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Introduction to the study of folklore as the traditional aesthetic expressions of a people, and to its principal forms. Only prose forms of folk literature (e.g., folk tale and legend) will be considered. Prerequisite: Evidence of competent reading knowledge of one relevant language other than English.

C LIT 516. *Studies in Folklore: Poetic Forms.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of competent reading knowledge of one relevant language other than English.

C LIT 517. *The Greek and Latin Tradition in European Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Some knowledge of Greek but more particularly of Latin, or consent of the Department.

C LIT 518. *The Biblical Tradition in Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). This course will deal with biblical themes, characters and styles and their utilization in later works. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 519. *Comparative Studies in the Asian and Western Tradition.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Studies in the impact of Asian literature on the Western literary tradition, with some references to Western influences on the East. Prerequisite: Competent reading knowledge of one relevant language other than English (e.g., German, French).

C LIT 520. *Comparative Studies in Medieval Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of either Latin, or French or the consent of the Department.

C LIT 529. *Studies in Renaissance Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Comparative studies in Renaissance literary theory and criticism, with particular emphasis on Italian, Spanish, French, and English texts. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 530. *Comparative Studies in European Drama of the Sixteenth and Seventeenth Centuries.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 545. *Comparative Studies in Eighteenth-Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.) Accepted as an option only.

C LIT 550. *Comparative Studies in Romantic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 552. *Comparative Studies in Realistic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 553. *Comparative Studies in Naturalistic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A study of Naturalism as an international movement. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 554. *Comparative Studies in the Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A course designed as an intensive study of the genre on an international basis. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 555. *Comparative Studies in Literature of the Late Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 556. *Advanced Comparative Studies in Traditional and Post-Colonial Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0). This course is designed as an advanced comparative study of the literatures of Africa in French and English with respect to their development from their traditional, i.e., oral forms. Some material will be drawn from Asian (i.e. Chinese) and Latin American literatures. Prerequisite: Competent reading knowledge of French, Spanish, or Portuguese, or consent of the Department.

C LIT 560. *Comparative Studies in Canadian Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 565. *Comparative Studies in the Epic.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 567. *The Romance.* ★3 (either term, 3-0-0) or ★6 (3-0-0). An examination of the history and major developments of the narrative form of the romance from Greek beginnings, through Medieval and Renaissance examples, to modern texts. Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 568. *Comparative Studies in the Pastoral.* ★3 (either term, 3-0-0). A course designed to describe the history and the characteristics of the pastoral genre. Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 570. *Comparative Studies in Comedy.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of French.

C LIT 575. *Tragedy: A Theoretical Approach.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A course designed to establish principles of criticism for the study of tragedy as a literary genre. Prerequisite: Competent reading knowledge of French, and another relevant language such as Spanish, German, or Greek.

C LIT 580. *Comparative Studies in Literary Parody.* ★3 (either term, 3-0-0). A theoretical approach to parody as a literary procedure, differentiating it from neighboring forms such as irony and satire, with a historical introduction to its main forms and its place in literary history. Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 585. *Studies of Forms and Genres.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A comparative historical and theoretical approach to particular international literary forms and genres. The content of the course is to change from year to year and instructor to instructor. Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 590. *Studies of Motifs and Themes.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one language other than English.

C LIT 595. *Special Topics in Comparative Literary History.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of at least one relevant language other than English. Note: Normally open to graduate students of literature only.

C LIT 599. *Tutorial.* ★0 (2-0-0). Special workshop arranged on a voluntary basis for graduate degree candidates of Comparative Literature, involving experiments in research and/or teaching skills in Comparative Literature. Prerequisite: Participation in a graduate degree program in Comparative Literature.

C LIT 609. *Special Topics in Asian Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 610. *Special Topics in Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 611. *Marxist Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 612. *Marxist Concepts of Literature in the Twentieth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 628. *Comparative Studies in the Renaissance and Baroque Literature of Italy, Spain and France, and its Counterparts in England.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: A reading knowledge of at least one relevant language, in addition to French.

C LIT 638. *Avant-garde Trends in Twentieth Century Slavic and Western Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 640. *Socialist Realism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of one relevant language other than English.

C LIT 641. *Surrealism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of competent reading knowledge of at least one relevant language other than English.

C LIT 642. *Literary Existentialism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Evidence of a competent reading knowledge of at least one relevant language other than English.

C LIT 645. *Comparative Studies in Twentieth-Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of at least one relevant language other than English.

C LIT 646. *Comparative Studies in Modern Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of one relevant language other than English.

C LIT 648. *Comparative Studies in French and English Literature, 1830-1900.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 649. *Franco-German Literary Relations during the Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of French and German.

C LIT 695. *Anglo-German Literary Relations from the Sixteenth to the Nineteenth Centuries.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Competent reading knowledge of German.

C LIT 696. *Seminar Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Designed to meet the needs of Ph.D. candidates in Comparative Literature in their last year of residence. Prerequisite: Competent reading knowledge of two languages other than English.

C LIT 697. *Special Reading Course I.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

C LIT 698. *Special Reading Course II.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

C LIT 699. *Conference Course.* ★3 (either term, 0-3s-0); or ★6 (0-3s-0). Designed to meet the needs of individual degree candidates in Comparative Literature.

44.11 Drama

44.11.1 JUNIOR COURSES

DRAMA 200. *Theatre Art Analysis.* ★6 (2-2s-0). Critical analysis of selected plays and its application to creative solutions in their production. Analysis of contributing arts of the theatre: playwriting, acting, designing, and directing.

DRAMA 230. *Beginning Movement.* ★6 (0-6L-0). Fundamental concepts and practice in creative movement forms. Note: Restricted to B.F.A. (Drama) students.

DRAMA 240. *Voice and Speech.* ★6 (0-5L-0). Intensive voice and speech improvement; oral interpretation of poetry, prose, and dramatic literature. Note: Restricted to B.F.A. (Drama) students.

DRAMA 243. *Introduction to Oral Communication.* ★3 (either term, 0-6L-0). Exercises in voice and speech improvement; elements of oral communication and interpretation. Note: Formerly part of DRAMA 241. Restricted to B.A. and B.Ed. Drama Majors. Not open to students with credit in DRAMA 245.

DRAMA 245. *Introduction to and Development of Oral Communication.* ★6 (0-4L-0). Exploration of basic techniques of oral communications and oral interpretation drawing from various forms of literature. Note: Not open to students with credit in DRAMA 243, DRAMA 341, and former DRAMA 343.

DRAMA 251. *Improvisation.* ★3 (either term, 0-6L-0). Speech and movement improvisation with an emphasis on imaginative development; introduction to dramatic form.

DRAMA 253. *Improvisational Drama.* ★3 (either term, 0-6L-0). Developing a sense of dramatic form through improvisational and environmental techniques. Prerequisite: DRAMA 251 or DRAMA 250.

DRAMA 254. *Acting Techniques.* ★6 (0-8L-0). Restricted to B.F.A. (Drama) Students.

DRAMA 255. *First Year Acting in Rehearsal and Performance.* ★2 (Second Term, 0-0-2). Note: Restricted to B.F.A. Acting students.

DRAMA 257. *Voice and Movement Coaching in Rehearsal and Performance.* ★2 (Second Term, 0-2L-0). Note: Restricted to B.F.A. Acting students.

DRAMA 270. *Stagecraft and Design.* ★6 (0-6L-0). Investigation of skills involved in staging a play, such as use of materials and methods of construction. Restricted to B.F.A. (Drama) Students.

DRAMA 271. *Theatre Design Aesthetics.* ★6 (0-4L-0). Practical exploration and discovery of aesthetic elements in theatre art. Note: Restricted to B.F.A. (Drama) students.

DRAMA 272. *Theatre Design Techniques.* ★6 (0-9L-0). Theory and practice of drawing and painting for the stage. Prerequisite: Consent of the Department.

DRAMA 273. *Introduction to Stagecraft and Design.* ★3 (Second Term, 0-6L-0). Investigation of skills involved in staging a play, such as use of materials and methods of construction. Note: Formerly part of DRAMA 270.

DRAMA 275. *Production Lab I.* ★3 (1-0-3). Technical theatre practice. Preparation and running of the production aspects of departmental plays. Note: A single-term course offered over a full year. Formerly part of DRAMA 270. Prerequisite: DRAMA 273 or consent of the Department.

DRAMA 293. *Production Lab II.* ★3 (0-0-3). Production experience in stage managing and/or apprenticeship with qualified technical staff. Prerequisite: Consent of the Department. Note: A single-term course offered over the full year.

44.11.2 SENIOR COURSES

DRAMA 300. *Theatre of the Past.* ★6 (3-0-0). History of the theatre from the Greeks to the end of the nineteenth century; study of major plays and theatre artists in the context of their time; parallels with other art forms. Prerequisite: Consent of the Department.

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

INT D 301. *The Hollywood Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

DRAMA 303. *History of Canadian Theatre from its Origins to the Depression (1925-30).* ★3 (either term, 3-0-0). A survey of the evolution of theatre art in French and English Canada with reference to the related arts of painting and architecture.

DRAMA 321. *The Creative Process of Drama.* ★3 (First Term, 2-1s-0). Theory of the creative process of drama related to the development of human resources. Prerequisite: DRAMA 251 or consent of the Department.

DRAMA 323. *Improvisation and Youth Theatre.* ★3 (Second Term, 0-4L-0). Practical and theoretical study of improvisational production applied to concepts of Theatre by and for youth. Prerequisite: DRAMA 321 and/or consent of the Department.

DRAMA 330. *Movement.* ★6 (0-6L-0). Introduction to movement forms for the actor. Prerequisite: DRAMA 230. Note: Restricted to B.F.A. (Drama) students.

DRAMA 335. *Second Year Movement Coaching in Rehearsal and Performance.* ★2 (0-2L-0). Note: A single-term course offered over the full session. Restricted to B.F.A. Acting students.

DRAMA 340. *Advanced Voice and Speech.* ★6 (0-5L-0). Extension of the voice; development of vocal sensitivity in order to meet the demands of characterization and varying forms of dramatic literature; sight reading. Prerequisite: DRAMA 240. Note: Restricted to B.F.A. (Drama) students.

DRAMA 341. *Oral Interpretation.* ★3 (either term, 0-6L-0). Poetry, prose and dramatic literature. Note: Formerly part of DRAMA 241. Prerequisite: DRAMA 243, or DRAMA 245, or consent of the Department.

DRAMA 345. *Second Year Speech in Rehearsal and Performance.* ★2 (0-0-2). Note: Restricted to B.F.A. Acting students. A half-course offered over the full session.

DRAMA 350. *Advanced Acting.* ★6 (0-10L-0). Discovery and development of techniques of characterization; intensive text analysis and classroom production. Prerequisite: DRAMA 254. Note: Restricted to B.F.A. (Drama) students.

DRAMA 351. *Basic Make-up.* ★1 (Second Term, 0-0-3). Practice in use of basic materials in creating stage make-up. Note: Restricted to B.F.A. (Drama) students and B.Mus. (Voice) students.

DRAMA 353. *Principles of Acting.* ★3 (either term, 0-6L-0). Study and enactment of scenes from plays. Note: Formerly part of DRAMA 250. Prerequisite: DRAMA 251, or 252, or consent of the Department.

DRAMA 355. *Second Year Acting in Rehearsal and Performance.* ★2 (0-0-3). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 357. *Techniques in Rehearsal and Performance.* ★3 (either term, 1-0-5). Research, rehearsal, design, staging, and presentation of a play by an acting ensemble. Prerequisites: DRAMA 353 and/or consent of Department.

DRAMA 359. *Techniques of Improvisational Production.* ★3 (First Term, 0-6L-0). Practice in the preparation of improvisational theatre. Prerequisites: DRAMA 251, and DRAMA 253, or DRAMA 323, or consent of the Department. Note: Formerly part of DRAMA 352.

DRAMA 360. *Elements of Playwriting.* ★6 (0-4L-0). Study of and practice in creating the elements of a play. Prerequisite: ENGL 200 or its equivalent, and consent of the Department.

DRAMA 370. *Theatre Design.* ★6 (0-9L-0). Study of and practice in the principles of design for the play. Prerequisite: Consent of the Department.

DRAMA 372. *Production Techniques — Scenery.* ★6 (0-6L-0). Prerequisite: Consent of the Department. Note: Formerly DRAMA 474.

DRAMA 375. *History of Decor and Dress.* ★6 (3-0-0). Note: Not open to students with credit in CL TX 304 and 403.

DRAMA 383. *Introduction to Directing.* ★3 (either term, 0-4L-0). Fundamentals of directing explored through practical exercises. Prerequisite: Consent of the Department.

DRAMA 385. *Elements of Directing.* ★3 (either term, 0-6L-0). Developing the director's creative use of the elements of directing through practical exercises in scripted scenes. Note: Formerly part of DRAMA 382. Prerequisite: DRAMA 383.

DRAMA 393. *Production Lab II B.* ★2 (0-0-2). Production organization; experience in running of a play in performance. Restricted to B.F.A. (Drama) students. Note: A single-term course offered over the full session.

DRAMA 395. *Running Crew Projects.* ★3 (0-0-6). Production organization: experience in preparing and running of a play in performance. Prerequisite: DRAMA 273. Note: Formerly DRAMA 394. Note: A single-term course offered over the full session.

DRAMA 400. *Modern Theatre.* ★6 (3-0-0). Major plays and theatre artists of the modern theatre. Exploration of the styles and movements which form the mosaic of the contemporary theatre.

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). See §44.22. Accepted as an option only.

DRAMA 403. *Modern Canadian Theatre.* ★3 (either term, 3-0-0). Survey of modern Canadian theatre.

DRAMA 405. *Honors Seminar.* ★3 (either term, 0-2s-0).

DRAMA 425. *Theatre for Young Audiences.* ★3 (either term, 0-6L-0). Theory and practice of theatre for young audiences including participatory techniques. Prerequisite: DRAMA 321 or 353 and/or consent of the Department.

DRAMA 430. *Theatre Movement.* ★6 (0-6L-0). Study of and practice in styles of movement and dance, both period and contemporary; projects in styles and choreography. Prerequisite: DRAMA 330. Note: Restricted to B.F.A. (Drama) students.

DRAMA 431. *Corporeal Mime.* ★3 (0-3L-0). Explorations in corporeal mime for the actor: technique and improvisation. Note: A single-term course offered over the full session. Restricted to B.F.A. Acting students.

DRAMA 434. *Lyric Theatre.* ★6 (0-6L-0). Exploration in theatre forms employing movement, music, dance, and acting. Prerequisite: Consent of the Department.

DRAMA 435. *Third-Year Movement in Rehearsal and Performance.* ★2 (0-3L-0). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 441. *Advanced Speech.* ★6 (0-6L-0). Extension of vocal techniques, work on text from period styles. Prerequisite: DRAMA 340. Note: Restricted to B.F.A. (Drama) students. Formerly DRAMA 540.

DRAMA 445. *Third-Year Speech in Rehearsal and Performance.* ★2 (0-3L-0). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 450. *Styles of Acting.* ★6 (0-10L-0). Study of and practice in the main period styles of acting; developing an actor's awareness of his/her place in the total dramatic event. Prerequisite: DRAMA 350. Note: Restricted to B.F.A. (Drama) students.

DRAMA 455. *Third-Year Acting in Rehearsal and Performance.* ★3 (0-4L-0). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 459. *Improvisational Production.* ★3 (Second Term, 0-6L-0). Form and content in improvisational theatre. Prerequisite: DRAMA 359 or consent of the Department. Note: Formerly part of DRAMA 352.

DRAMA 460. *Playwriting.* ★6 (3-0-0). The theory and practice of writing for dramatic media: stage, film, radio, and television. Prerequisite: DRAMA 360 or consent of the Department.

DRAMA 470. *Styles of Design.* ★6 (0-9L-0). Study of and practice in design for the period play. Prerequisite: DRAMA 370. Note: Restricted to B.F.A. (Drama) students.

DRAMA 472. *Production Techniques — Costume.* ★6 (0-6L-0). Prerequisite: Consent of the Department. Note: Formerly DRAMA 373/374.

DRAMA 493. *Production Lab III.* ★3 (either term, 0-0-6). Practical experience in assisting the designer. Corequisite: DRAMA 470. Note: Restricted to B.F.A. (Drama) students.

DRAMA 501. *Seminar in Contemporary theatre.* ★3 (either term, 0-3s-0). Exploration of developments in contemporary Drama and theatre production in the western world.

DRAMA 507. *Senior Projects.* ★3 (either term, 1-0-4). Prerequisite: Consent of the Department.

DRAMA 509. *Play Production Process.* ★3 (either term, 0-6L-0). The problems in execution of the complete script. Prerequisite: DRAMA 385 and consent of the Department.

DRAMA 530. *Advanced Movement.* ★6 (0-6L-0). Instruction and projects for individual growth in movement expression. Prerequisite: DRAMA 430. Note: Restricted to B.F.A. (Drama) students.

DRAMA 535. *Fourth-Year Movement in Rehearsal and Performance.* ★3 (0-4L-0). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 541. *Dialects and Accents.* ★6 (0-6L-0). Survey of dialects and accents; intensive practice in representative examples from the British Isles, Europe, and North America. Tutorial instruction to suit the actor's vocal needs. Prerequisite: DRAMA 441. Note: Restricted to B.F.A. (Drama) students. Note: Formerly DRAMA 440.

DRAMA 545. *Fourth-Year Speech in Rehearsal and Performance.* ★3 (0-4L-0). Note: Restricted to B.F.A. Acting students. A single-term course offered over the full session.

DRAMA 551. *Advanced Make-Up.* ★2 (First Term, 1-0-2). Practice in use of special materials and in creating character make-up. Prerequisite: DRAMA 351. Note: Restricted to B.F.A. (Drama) students.

DRAMA 552. *Collective Theatre.* ★6 (0-8L-0). The collective preparation and public presentation of improvisational theatre. Prerequisite: DRAMA 459 and/or consent of the Department. Note: Not to be taken by students with credit in DRAMA 452.

DRAMA 565. *Senior Projects in Dramatic Writing.* ★3 or ★6 (either term, 1-0-4). Prerequisite: Consent of the Department.

DRAMA 570. *Advanced Design.* ★6 (0-9L-0). Study of and practice in design for the modern play. Prerequisite: DRAMA 470. Note: Restricted to B.F.A. (Drama) students.

DRAMA 575. *Production Techniques - Lighting.* ★6 (0-6L-0). Study of and practice in the aesthetics and practical tools in stage lighting. Prerequisite: Consent of the Department. Note: Formerly part of DRAMA 570.

DRAMA 592. *Advanced Acting and Directing Projects.* ★6 (0-0-15). Rehearsal and performance of roles in public productions. Prerequisite: DRAMA 450. Note: Restricted to B.F.A. (Drama) students.

DRAMA 593. *Production Lab IV.* ★6 (0-0-6). Practical experience in assistant designing. Corequisite: DRAMA 570. Note: Restricted to B.F.A. (Drama) students.

DRAMA 595. *Professional and Critical Orientation.* ★0 (2-0-0). A non-credit course required for graduation. Note: Restricted to fourth-year B.F.A. (Drama) students.

DRAMA 665. *Special Projects in Dramatic Writing.* ★3 or ★6 (either term, 1-0-4). Prerequisite: Consent of the Department.

44.11.3 HONORS AND GRADUATE COURSES

DRAMA 500. *Theatre Aesthetics.* ★6 (3-0-0). A study of problems in dramatic theory and criticism as related to the evolution of modern theatre aesthetics. Prerequisite: Consent of the Department.

DRAMA 501. *Seminar in Contemporary Theatre.* ★3 (either term, 0-3s-0). Exploration of developments in contemporary Drama and theatre production in the western world.

DRAMA 565. *Senior Projects in Dramatic Writing.* ★either 3 or 6 (either term, 1-0-4). Prerequisite: Consent of the Department.

DRAMA 505. *Honors Seminar.* ★6 (0-3s-0).

DRAMA 601. *Methods and Tools of Research.* ★3 (First Term, 3-0-0).

DRAMA 604. *Research in Theatre History.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Research in aspects of physical theatre and production.

DRAMA 605. *Special Projects in Theatre.* ★3 (either term, 1-0-4) Prerequisite: Consent of the Department.

DRAMA 607. *Dramaturgy I.* ★3 (either term, 3-0-0).

DRAMA 608. *Research Seminar.* ★6 (0-3s-0). Research in selected topics.

DRAMA 610. *Applied Criticism.* ★3 (either term, 3-0-0). Critical analysis of theatre practice.

DRAMA 616. *Research in Canadian Drama.* ★6 (3-0-0). Note: Formerly part of DRAMA 606.

DRAMA 618. *Advanced Research Seminar.* ★6 (0-3s-0). Advanced research in selected topics. Prerequisite: DRAMA 608 or consent of the Department.

DRAMA 660. *Playwriting Projects.* ★6 (0-0-3). Prerequisite: Consent of the Department.

DRAMA 661. *Advanced Playwriting Projects.* ★6 (0-0-3).

DRAMA 665. *Special Projects in Dramatic Writing.* ★either 3 or 6 (either term, 1-0-4). Prerequisite: Consent of the Department.

DRAMA 670. *Styles in Total Design.* ★6 (0-6L-0). Note: Restricted to M.F.A. (Drama) students.

DRAMA 671. *Advanced Theatre Design.* ★6 (0-6L-0). Note: Restricted to M.F.A. (Drama) students.

DRAMA 672. *Design for Directors.* ★6 (0-4L-0). Corequisites: DRAMA 660, 661, 680 or 681. Note: Restricted to M.F.A. (Drama) students.

DRAMA 680. *Styles of Directing.* ★6 (0-3s-6). Note: Restricted to M.F.A. (Drama) students.

DRAMA 681. *Advanced Projects in Directing.* ★6 (0-3s-6). Note: Restricted to M.F.A. (Drama) students.

DRAMA 695. *Seminar in Theatre Aesthetics.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

44.12 East European and Soviet Studies

Division of Eastern European Studies

44.12.1 SENIOR COURSES

INT D 341. *Romania and Romanians.* ★3 (Second Term, 3-0-0). Included in the course is the history of Romania, the nature of its language, and the social, political, cultural, and economic development of Romania, and of Romanian settlements, especially those in the Moldavian SSR and in Canada.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). An interdisciplinary introduction to the study of the socialist system with special reference to the Soviet Union and East Europe. (Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology).

INT D 347. *Women and Socialism: USSR and Eastern Europe.* ★3 (Second Term, 3-0-0). Theory and practice of socialism as related to the status of women in Eastern Europe and the Soviet Union. Prerequisite: Consent of the Division of East European Studies. Note: Not open to students who have taken POL S 342 in 1977-78.

INT D 355. *Social Problems of Eastern Europe Under State Socialism.* ★3 (3-0-0). The socio-cultural and economic consequences of major structural transformations in East European societies, with particular emphasis on family life, the socialization of youth, work relations, popular culture, and social deviance.

INT D 443. *The Soviet North and Siberia.* ★3 (Second Term, 3-0-0). The economy, political administration, and the social development of the native peoples of Siberia and the Soviet North. Prerequisite or corequisite: An area-related course in one of Geography, Political Science, Economics, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies, and Departments of Anthropology, Economics, and Geography).

INT D 444. *The Ukraine.* ★3 (Second Term, 3-0-0). Major social, economic, political and cultural trends in the Ukrainian SSR in the post-World War II period. Prerequisite or corequisite: An area-related course in one of Geography, History, Political Science, or Ukrainian, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies, and Departments of History, and Slavic Languages).

INT D 445. *Poland.* ★3 (First Term, 3-0-0). The political, social, economic, and cultural developments in post World War II. Prerequiste: INT D 346, or POLSH 304 or equivalent, or demonstration to the Division of East European Studies of sufficient background in the area. (Participating units normally include Division of East European Studies, and Departments of Economics, Fine Arts, Geography, Slavic Languages, and Sociology).

INT D 446. *Eastern Europe: A Travel Study Course.* ★6 (5-0-15). An intensive interdisciplinary study of Eastern Europe and the Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Spring or Summer Session in countries of Eastern Europe and the USSR on a selected basis and includes intensive study in one or more countries. Prerequisite: INT D 346, or consent of Division. Pre-session study and preparation.

44.12.2 HONORS AND GRADUATE COURSE

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar. (Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology).

NOTE: For additional courses relating to the Soviet Union and Eastern Europe, see also entries under Comparative Literature, Economics, Educational Foundations, Geography, History, Philosophy, Polish, Political Science, Russian, Slavics, and Ukrainian.

44.13 Economics

44.13.1 JUNIOR COURSES

ECON 201. *Introduction to Micro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems, and policies with emphasis on the Canadian economy; the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy: the distribution of income, inequality, and poverty; the use of the environment; government economic policies. Prerequisite: Mathematics 20, or Mathematics 33, or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems, and policies with emphasis on the Canadian economy: national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies; international trade theory, problems, and government policies. Prerequisite: Mathematics 20, or Mathematics 33, or consent of the Department.

44.13.2 SENIOR COURSES

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). (See § 44.22.)

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). (See § 44.22.)

ECON 306. *General Macro-Economics.* ★3 (either term, 3-0-0). Introductory survey of macroeconomic principles with an emphasis on Canadian economic issues. Note: Designed for students who do not hold credit in ECON 202 or 304. ECON 306 plus 307 are acceptable in place of ECON 201/202 as prerequisites for senior courses with the consent of the Department.

ECON 307. *General Micro-Economics.* ★3 (either term, 3-0-0). Introductory survey of microeconomic principles with an emphasis on Canadian economic issues. Note: Designed for students who do not hold credit in ECON 201 or 304. ECON 306 plus 307 are acceptable in place of ECON 201/202 as prerequisites for senior courses with the consent of the Department.

ECON 308. *American Economic Development I.* ★3 (First Term, 3-0-0). A survey to the end of the nineteenth century with emphasis on industrial development and related government policies. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 309. *American Economic Development II.* ★3 (Second Term, 3-0-0). Analysis of American economic development in the twentieth century to present. Prerequisite: ECON 308.

ECON 310. *Japanese Economic Development.* ★3 (either term, 3-0-0). An analytical survey of economic factors leading to Japan's present position in world trade. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 311. *Middle East Economic Development.* ★3 (either term, 3-0-0). The recent economic development of the Middle East. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 312. *Western European Economic Development.* ★3 (either term, 3-0-0). A survey of economic changes in Western Europe from the Industrial Revolution to the present. Note: Not to be taken by students with credit in HIST 357.

ECON 313. *Economics of Developing Countries I.* ★3 (First Term, 3-0-0). A survey of problems and conditions generally characteristic of the low-income countries; an introduction to theories and models of economic growth and development; a discussion of applied strategies of development with specific policy applications bearing on fiscal and monetary management, the process of capital formation and industrialization, employment and technological change. Prerequisites: ECON 201/202 or 306/307, or consent of the Department. Note: Formerly ECON 412.

ECON 314. *Economics of Developing Countries II.* ★3 (Second Term, 3-0-0). The theoretical and policy aspects of specific economic development problems: population, agriculture, natural resources, education and manpower training, international trade, foreign aid, and technical assistance. Prerequisites: ECON 201/202, or 306/307, or consent of the Department. Note: Formerly ECON 413.

ECON 315. *Eastern European Economic Development.* ★3 (either term, 3-0-0). A survey of the economies of Eastern Europe, particularly members of the Council of Economic Mutual Assistance (COMECON) as well as Yugoslavia and Albania. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 316. *The Canadian Economy, Part I.* ★3 (either term, 3-0-0). A survey of Canadian economic development with emphasis on the function of staple exports, capital formation, government policies, and regional differentials which characterized the nineteenth century in Canada. Note: A student may not receive credit in both ECON 316 and 318.

ECON 317. *The Canadian Economy, Part II.* ★3 (either term, 3-0-0). A survey of the economic development of Canada in the twentieth century. This survey includes study of immigration, foreign investment, economic effects of two world wars, natural resource exploitation and the emergence of distinct economic regions in Canada. Prerequisite: ECON 316 or consent of the Department. Note: A student may not receive credit in both ECON 317 and 319.

ECON 318. *Canadian Economic Development in the Twentieth Century Part I.* ★3 (First Term, 3-0-0). Analysis of Canadian economic development in the light of economic theory: The impact of prairie settlement, the First World War, foreign investment, regional disparities in income, and the Great Depression. Prerequisites: ECON 201/202 or consent of the Department. Note: A student may not receive credit in both Economics 316 and 318.

ECON 319. *Canadian Economic Development in the Twentieth Century, Part II.* ★3 (Second Term, 3-0-0). Analysis of Canadian economic development in the light of economic theory: The impact of the Second World War, extensive foreign investment, economic relations with the United States and Europe, North American continentalism, tariffs, and some consideration of the economic prospects of the Canadian economy. Prerequisite: ECON 318. Note: A student may not receive credit in both ECON 317 and 319.

ECON 323. *International Economics.* ★3 (either term, 3-0-0). A survey of the principles of international economics and the applications to economic policy. The topics are foreign trade, foreign investment, and the balance of payments. Prerequisites: ECON 201/202 or consent of the Department.

ECON 331. *Labor Economics.* ★3 (First Term, 3-0-0). Theory and empirical evidence concerning the supply of and demand for labor services, wage differentials, and the impact of unions. Some of the policy issues to be discussed are income maintenance, unemployment insurance, and minimum wage legislation. Prerequisites: ECON 201/202 or consent of the Department.

ECON 332. *Manpower Economics.* ★3 (Second Term, 3-0-0). Analytical and policy issues relating to human resource development and manpower utilization with particular reference to Canadian contemporary issues. Prerequisite: ECON 331 or consent of the Department.

ECON 334. *Economics of Poverty.* ★3 (either term, 3-0-0). An examination of the economic factors associated with low income levels and standards of living of various Canadian occupational groups. Proposals to alleviate certain low income problems — the guaranteed income plan, the negative income tax proposition, etc. A critical appraisal of existing Federal, Provincial, and Municipal programs in the Welfare and related fields. Prerequisites: ECON 201/202, or 306/307, or 304, or consent of the Department.

ECON 341. *Money and Finance.* ★3 (either term, 3-0-0). Analysis of money and credit in the exchange process; the savings-investment process; commercial banking; financial intermediaries; financial markets; central banking. Prerequisites: ECON 201/202 or consent of the Department.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.)

ECON 351. *The Public Sector.* ★3 (either term, 3-0-0). The rationale of the public sector and its development in Canada; analysis of public decision making and the budgetary process. Prerequisites: ECON 201/202 or consent of the Department.

ECON 352. *Economics of Taxation.* ★3 (either term, 3-0-0). Analysis of the effects of alternative levels of total taxation (budgetary tax policy) and alternative types of taxes (tax mix policy) on the economic decisions of households and business firms as reflected in the composition of national output, the distribution of national income, and the level and stability of economic activity. Prerequisites: ECON 201/202 or consent of the Department.

ECON 353. *Taxation Policy and Structure.* ★3 (either term, 3-0-0). Analysis of the Canadian tax structure and its role in attaining certain goals of society; requirements for an optimal tax structure. Prerequisites: ECON 201/202 or consent of the Department.

ECON 355. *Economic Analysis in the Evaluation of Large-Scale Projects.* ★3 (either term, 3-0-0). An examination of the use of cost-benefit analysis, location theory, and input-output analysis in assessing the economic merits of various large-scale investment projects. Examples of current interest will be used, e.g., river basin, electrical generation, and oil and gas projects. Prerequisites: ECON 201/202, or 304, or consent of the Department.

ECON 356. *The Economics of Education.* ★3 (either term, 3-0-0). An examination of the resource allocation within the educational sector of the economy. Selected topics deal with education today as an input into production and consumption tomorrow, manpower planning and education, educational planning and decision-making, productivity and cost considerations in the educational firm, and the use of budgetary systems in allocating resources within the educational sector. Prerequisite: Consent of the Department.

INT D 357. *Health Care Economics.* ★3 (either term, 3-0-0). (See § 44.22.)

ECON 361. *Transportation Economics.* ★3 (either term, 3-0-0). Economic analysis of alternative transportation systems (water, air, road, and rail, for both freight and passengers). Role of transportation in urban, regional, and national economic development. Public policy toward transportation. Prerequisites: ECON 201/202.

ECON 362. *Introduction to Urban Economics.* ★3 (either term, 3-0-0). An examination and analysis of the relationships of urbanization and economic growth, the economic aspects of urban spatial organization, housing, and transportation, and the urban public economy. Special attention to Canadian urban economic issues. Prerequisites: ECON 201/202, or 304, or 306/307, or consent of the Department.

ECON 363. *Introduction to Regional Economics.* ★3 (either term, 3-0-0). An appraisal of the historical and current pattern of regional income disparities in Canada, with analysis emphasizing the causes of regional variations in employment and economic growth levels. An assessment of present federal and provincial policies designed to alleviate regional disparities will be made, combined with new policy programs that may be relevant. Prerequisites: ECON 201/202 or consent of the Department.

ECON 364. *Economics of the Prairie Region.* ★3 (either term, 3-0-0). Economic history and the contemporary economic situation; agriculture, resources development, potential for economic diversification in manufacturing and service industries, the prairie region in the national economy — tariffs, transportation, monetary policy, energy policy. Prerequisites: ECON 201/202, or 304 or 306/307.

ECON 365. *Resource Economics.* ★3 (either term, 3-0-0). Problems of allocation and development of natural resources, including contemporary Canadian resource policy issues; nature and types of resources; the economics of conservation and resource scarcity; and the role of resources in growth. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 366. *Energy Economics.* ★3 (either term, 3-0-0). Types of energy resources, substitutability, conversion. The relevance of energy to economic growth. Energy as input and as a consumers' good. An overview of quantities available and used. The problems of measuring energy, the energy balance, the energy industries. The role of energy in the Canadian economic development. World energy markets. Energy policy problems. Prerequisites: ECON 201/202, or 304, or 306/307.

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). (See § 44.22.)

INT D 369. *Economics of the Environment.* ★3 (either term, 3-0-0). (See § 44.22.)

ECON 373. *Industrial Organization.* ★3 (either term, 3-0-0). A survey of the behavior and performance of firms in different market structures, and discussion of public policy toward the different structures. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 312.

ECON 374. *Economics of Regulation.* ★3 (either term, 3-0-0). The study of the economic issues relating to the regulation and the operation of provincial and federal regulatory bodies in a number of industries. Among the industries studied are the natural gas and electrical utilities, and the transportation and communication industries. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 381. *Micro-Economic Analysis I.* ★3 (either term, 3-0-0). The theory of consumer behavior; theory of production and cost; price and output determination under competition, monopoly and other market structures. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 323.

ECON 382. *Macro-Economic Analysis I.* ★3 (either term, 3-0-0). National income concepts and income determination; theories of aggregate consumption, investment and employment behavior; monetary and fiscal policy. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 333.

ECON 391. *Economic Institutions and Ideologies.* ★3 (either term, 3-0-0). Pre-capitalist Europe; the rise of individualism and the individualistic ethic; industrial capitalism; economics of Marx and Socialism; the rise of corporate capitalism; the consolidation of monopoly power; economic imperialism; Keynesian economics and economic policies; contemporary capitalism and its critics.

ECON 392. *Comparative Economics.* ★3 (either term, 3-0-0). A comparative study of the institutions and theories of important contemporary systems of economic organization, with emphasis on the "mixed" capitalist economy, "market socialism", and centrally planned economics. A survey of socialist economic thought in particular Marxian economics. Prerequisites: ECON 201/202 or consent of the Department.

ECON 393. *The Soviet Economy.* ★3 (either term, 3-0-0). The development and institutional arrangements of the Soviet economy, Soviet experience with central planning. Economic performance and its evaluation. Soviet economic reforms. Prerequisites: ECON 201/202 or consent of the Department.

ECON 394. *The Political Economy of the New Left.* ★3 (either term, 3-0-0). A survey and criticism of the economic views of the New Left radicalism. Prerequisites: ECON 201/202, or 304, or 306/307.

ECON 395. *Statistics for Economists I.* ★3 (First Term, 3-0-1). An introduction to statistical concepts and their application in economics. Sources and uses of data in economic research; descriptive statistics; elementary probability and sampling theory. Prerequisites: ECON 201/202 or consent of the Department.

ECON 396. *Statistics for Economists II.* ★3 (Second Term, 3-0-1). Estimation and tests of hypotheses; regression analysis; analysis of variance; index numbers and time series. Prerequisite: ECON 395 or consent of the Department.

ECON 403. *History of Economic Thought.* ★3 (either term, 3-0-0). A survey of economic opinions and theories with special attention to modern times. Emphasis on both theoretical analysis and socioeconomic structure at various epochs of economic thinking. Prerequisites: ECON 381/382.

ECON 405. *Computer Applications in Economics.* ★3 (either term, 3-0-0). An introduction to the relationship between economic analysis and modern high speed computers. Topics include computer techniques useful in economics, computerized statistical techniques, and examination of selected economic models of both a mathematical and stochastic nature. Prerequisites: ECON 381/382.

ECON 407. *Introduction to Econometrics I.* ★3 (First Term, 3-0-0). Statistical inference in economics. Topics in statistical theory with emphasis on estimation and tests of hypotheses. The general linear regression model. Prerequisites: ECON 381/382 or equivalent; ECON 395/396 or equivalent; MATH 202/221 or equivalent.

ECON 408. *Introduction to Econometrics II.* ★3 (Second Term, 3-0-0). Econometric problems and techniques with emphasis on regression methods. Single equation techniques and introduction to simultaneous equation systems. Applications in research projects. Prerequisite: ECON 407 or equivalent.

ECON 418. *Canadian Economic Development.* ★3 (either term, 3-0-0). Introduction to "new economic history," emphasizing the methodology of quantitative economic history research. Prerequisite: ECON 381; ECON 316, or 318, or consent of the Department.

ECON 421. *International Trade.* ★3 (First Term, 3-0-0). Nature and relevance of international trade; early trade doctrines; the theory of comparative advantage, classical and modern approaches and empirical evidence for them; new approaches to the pure theory of international trade; economic growth and international trade; market imperfections and trade; commercial policy; economic integration and the gains from trade. Prerequisites: ECON 381/382.

ECON 422. *International Economics.* ★3 (Second Term, 3-0-0). An analysis of short and long term capital movements, direct foreign investment in Canada, the foreign exchange market, balance of payments problems, international adjustment mechanisms and monetary arrangements. Prerequisites: ECON 381/382.

ECON 431. *Labor Economics.* ★3 (either term, 3-0-0). An advanced treatment of demand for labor, supply of labor, wage differentials, trade union behaviour, and related topics. Prerequisites: ECON 331; 381, or consent of the Department.

ECON 441. *Monetary Theory and Policy.* ★3 (either term, 3-0-0). The significance of price level changes; classical and Keynesian macro-economic models; theory of demand for money; theory of money supply; monetary policy. Prerequisite: ECON 382 or consent of the Department.

ECON 451. *Resource Allocation Within the Public Sector of the Canadian Economy.* ★3 (either term, 3-0-0). An examination of the basic economic principles and concepts which are utilized in allocating resources in the public sector of the Canadian economy. Prerequisites: ECON 351/352 or consent of the Department.

ECON 471. *Industrial Organization I.* ★3 (First Term, 3-0-0). Contemporary industrial structure; minimum efficient size of firms; business concentration; related topics, e.g., foreign investment in the Canadian economy and barriers to new competition. Prerequisite: ECON 381 or consent of the Department.

ECON 472. *Industrial Organization II.* ★3 (Second Term, 3-0-0). The behavior of firms in different market structures and the attendant economic performance. The development and administration of an effective competition policy: problems of law enforcement; adequate measures to deal with specific market

elements, e.g., price fixing, predatory pricing, mergers, misleading advertising. Prerequisites: ECON 381; ECON 373, or 471, or MANEC 312.

ECON 473. *Economics of Non-Market Activities.* ★3 (either term, 3-0-0). The application of economic analysis to such topics as crime, marriage, fertility and representative government. Prerequisites: ECON 201/202 and consent of the Department.

ECON 476. *Honors Seminar I.* ★3 (First Term, 0-3s-0). Note: Open only to third and fourth year students in Honors Economics.

ECON 477. *Honors Seminar II.* ★3 (Second Term, 0-3s-0). Note: Open only to third and fourth year students in Honors Economics.

INT D 478. *The Multinational Corporation and Public Policy.* ★3 (First Term, 3-0-0). (See § 44.22.)

INT D 479. *The Multinational Corporation and Public Policy: Case Studies.* ★3 (Second Term, 3-0-0). (See § 44.22.)

ECON 481. *Micro-Economic Analysis II.* ★3 (either term, 3-0-0). Theory of distribution; general equilibrium analysis; welfare economics. Prerequisite: ECON 381.

ECON 482. *Macro-Economic Analysis II.* ★3 (either term, 3-0-0). Inflation, employment, and macro-economic policy; business cycles and theories of economic growth; macro-economic forecasting and econometric models. Prerequisite: ECON 382.

ECON 486. *Applications of Mathematics to Economics I.* ★3 (First Term, 3-0-0). Elements of logic and set theory, linear algebra, differential calculus and their conjunction, as used in classical and modern economic analysis. Prerequisites: ECON 381/382; MATH 202/221 or equivalent.

ECON 487. *Applications of Mathematics to Economics II.* ★3 (Second Term, 3-0-0). Difference and differential equations, linear inequalities, convexity, programming; assorted theorems of special use in modern economic analysis. Prerequisite: ECON 486.

ECON 495. *Linear Economic Models.* ★3 (either term, 3-0-1). Input-Output analysis and its applications; optimisation in linear models; duality and shadow prices; special problems in activity analysis; analytical extensions. Prerequisites: ECON 381/382; MATH 202/221 or equivalent.

ECON 498. *Directed Readings I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ECON 499. *Directed Readings II.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

44.13.3 HONORS AND GRADUATE COURSES

Note: The consent of the Department is required for all of the following courses.

ECON 501. *History of Economic Thought.* ★3 (either term, 3-0-0). A survey of economic thought from Adam Smith to modern times, with particular attention to the theories of economic development and growth.

ECON 503. *Micro-Economic Theory I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482, 486/487, or corequisite ECON 597.

ECON 505. *Micro-Economic Theory II.* ★3 (either term, 3-0-0). Prerequisites: ECON 503, ECON 597, or equivalent.

ECON 507. *Econometrics I.* ★3 (First Term, 3-0-0). Statistical inference in economics. Probability and distribution theory including transformation of random variables and the multivariate normal. Estimation, including maximum likelihood methods. Tests of hypothesis including likelihood ratio tests. Prerequisites: ECON 395/396 or equivalent; MATH 202/221. Corequisite: ECON 486.

ECON 508. *Econometrics II.* ★3 (Second Term, 3-0-0). Single equation methods and problems. The general linear model, Aitken's generalization and associated problems, distributed lags, forecasting. Prerequisite: ECON 507 or equivalent.

ECON 509. *Econometrics III.* ★3 (either term, 3-0-0). Simultaneous equation methods and problems. The identification problem, simultaneous equation estimators and their properties. Forecasting and simulation with estimated structures. Prerequisite: ECON 507 or equivalent. Corequisite: ECON 508.

ECON 512. *Economic Development I.* ★3 (either term, 3-0-0). The techniques of development planning; qualitative and quantitative problems associated with the drafting and implementation of plans and programs; assessment of internal and external resources available for development and problems of measurement and mobilization of resources.

ECON 513. *Economic Development II.* ★3 (either term, 3-0-0). Economic policy alternatives in a context of growth and development; problems of inflation, balance of payments, disequilibrium, concentration of growth effects; the role of international aid and other external measures.

ECON 514. *Economic Development of Canada I.* ★3 (either term, 3-0-0). A selective analysis of historical factors involved in the economic growth and development of Canada. Consideration focused on strategies of resource involvement, especially human resources. Selected studies of regional development patterns.

ECON 515. *Economic Development of Canada II.* ★3 (either term, 3-0-0). Analysis of modern problems of economic growth and development in the Canadian economy. Consideration of the possibilities of further development that are contained in current policies of governments and in private sectors of the economy. Prerequisite: ECON 514.

ECON 521. *International Economics I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482, ECON 421/422 recommended.

ECON 522. *International Economics II.* ★3 (either term, 3-0-0).

ECON 523. *The International Economy.* ★3 (either term, 3-0-0). Balance of payments, foreign exchange markets, foreign investment, trade and commercial policy, international economic institutions. Note: Designed for graduate students whose specialization is not Economics.

ECON 531. *Labor Economics I.* ★3 (either term, 3-0-0). Factors influencing the supply of, and demand for, labor services and the process of relative wage determination in the long- and short-run. Determination of money wage levels, aggregate labor-force participation, and the level and structure of aggregate employment and unemployment.

ECON 532. *Labor Economics II.* ★3 (either term, 3-0-0). Topics in manpower and human resource development economics. The role of human resources in economic growth, human resources viewed as capital, problems and policies in planning, forecasting, and utilizing manpower contexts, methods of evaluating specific manpower programs and projects; and relationships between poverty and manpower utilization.

ECON 540. *Monetary Economics I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482.

ECON 541. *Monetary Economics II.* ★3 (either term, 3-0-0). Activities of financial intermediaries; evaluation of the effectiveness and the impact of monetary policy in both closed and open systems.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.)

ECON 550. *Public Expenditure.* ★3 (either term, 3-0-0). The theory of the role of the public sector in a market economy; market failures, income distribution, evaluation of public investment, public choice, and the economic theory of federalism. Prerequisites: Introductory, and preferably intermediate economic theory, and elementary calculus, or permission of instructor.

ECON 551. *The Canadian Public Economy.* ★3 (either term, 3-0-0). The economic objectives and growth of the Canadian public sector with emphasis on budgetary processes, intergovernmental fiscal relations and public policy problems and achievements. Note: This course is designed to be of interest to graduate students from other departments.

ECON 552. *Urban Economics.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482.

ECON 553. *Economics of Taxation.* ★3 (either term, 3-0-0). Effects of taxes on allocation, distribution and stabilization objectives. Evaluation of major taxes with particular attention paid to efficiency and incidence considerations. Note: Students deficient in economics will be admitted to the course only by consent of the instructor.

ECON 559. *Health Care Economics.* ★3 (either term, 3-0-0). Problems of resource allocation in the health care sector with special reference to the Canadian economy.

ECON 561. *Transportation Economics.* ★3 (either term, 3-0-0). Economic analysis of alternative transportation systems.

ECON 563. *Regional Economics I.* ★3 (either term, 3-0-0). Methodology of regional analysis including structural studies, location theory, input-output application, aggregative models and

impact studies; regional development policy issues within a context of senior government policy objectives.

ECON 564. *Regional Economics II.* ★3 (either term, 3-0-0). The role of inter-regional mobility and substitutability of factors of production in regional growth; regional production functions and the differential impact of technical change; studies in inter-regional trade and comparative advantage in production and marketing.

ECON 565. *Resource Economics I: The Economics of Conservation and Resource Scarcity.* ★3 (either term, 3-0-0). Economic analysis of quantitative aspects of natural resource use and development; the economics of conservation; the role of resources in growth; resource scarcity; quantitative tools (benefit-cost and input-output analysis) in resources management; selected Canadian resource management; selected Canadian resource issues.

INT D 566. *Resource Economics II: Economics of the Environment.* ★3 (either term, 3-0-0). (See § 44.22.)

ECON 567. *Canadian Energy Resources.* ★3 (either term, 3-0-0). An economic evaluation of the role of energy resources in the Canadian economy.

ECON 570. *Industrial Economics I.* ★3 (either term, 3-0-0). Contemporary industrial structure, conduct and performance-Canadian and foreign; related public policies.

ECON 571. *Industrial Economics II.* ★3 (either term, 3-0-0). Government enterprise, public regulation of private enterprise, and specific public policies concerning particular market elements, such as advertising, delivered pricing and patents.

ECON 581. *Macro-Economic Theory I.* ★3 (either term, 3-0-0). Prerequisite or corequisite: ECON 597 or equivalent.

ECON 582. *Macro-Economic Theory II.* ★3 (either term, 3-0-0). Prerequisites: ECON 581, ECON 597, or equivalent.

ECON 586. *Mathematical Economics.* ★3 (either term, 3-0-0). Applications and interpretations of tools used in economic analysis such as programming and game theory; inter-industry analysis, multi-sector growth models; mathematical approach to general equilibrium theory and other related areas. Emphasis on specific topics may vary from year to year. Prerequisites: ECON 486 / 487, or ECON 597, or equivalent.

ECON 591. *Comparative Economics.* ★3 (either term, 3-0-0). A survey of major contemporary systems of economic organization with emphasis on economic planning.

ECON 593. *The Soviet Economy.* ★3 (either term, 3-0-0). A graduate survey of the theory of the Soviet economy ; the Soviet enterprise and its behavior; Soviet planning and resource allocation; the problem of efficiency and pricing; Soviet national accounts, planning and overall economics performance; Soviet strategy of economic growth. International aspects of the Soviet economy. Soviet economic reform.

ECON 595. *Computer Applications in Economics.* ★3 (either term, 3-0-0). An introduction to the relationship between economic analysis and modern high speed computers. Topics include computer techniques useful in economics, computerized statistical techniques, and examination of selected economic models of both a mathematical and stochastic nature.

ECON 597. *Mathematical Analysis for Economists.* ★3 (either term, 3-0-0). A condensed selection of mathematical concepts used in economic analysis. Elements of logic and set theory; review of the calculus; differential and difference equations; linear algebra; inequalities; convexity. Prerequisites: MATH 202 / 221 or equivalent. Note: Designed for M.A. candidates or provisional Ph.D. students who do not have the equivalent of ECON 486 / 487.

ECON 598. *Statistical Methods for Economists.* ★3 (either term, 3-0-2). Random variables and probability distributions; estimation and tests of hypotheses; single equation estimation techniques and problems; survey of simultaneous equation estimation problems. The emphasis of this course is on regression techniques as applied in economic research. Note: Designed for M.A. candidates or provisional Ph.D. students who do not have the equivalent of ECON 407 / 408.

ECON 599. *Applied Econometrics.* ★3 (either term, 3-0-0). The role of economic theory in the process of specification and estimation of models. Interpretation and critical evaluation of applied work by means of selected topics in econometric theory. Prerequisites: ECON 408 or equivalent. Corerequisite: ECON 486 / 487.

ECON 608. *Topics in Econometrics.* ★3 (either term, 3-0-0).

ECON 612. *Topics in Economic Development.* ★3 (either term, 3-0-0).

ECON 620. *Topics in International Economics.* ★3 (either term, 3-0-0).

ECON 630. *Topics in Labor Economics.* ★3 (either term, 3-0-0).

ECON 640. *Topics in Monetary Economics.* ★3 (either term, 3-0-0).

ECON 652. *Topics in Public Economics.* ★3 (either term, 3-0-0). Topics available include: local public finance, project evaluation, theory of public choice, public enterprise pricing policies, health care economics, and fiscal systems.

ECON 664. *Topics in Regional Economics.* ★3 (either term, 3-0-0).

ECON 672. *Topics in Industrial Economics.* ★3 (either term, 3-0-0).

ECON 693. *Topics in Comparative Economics.* ★3 (either term, 3-0-0).

ECON 699. *Selected Research Topics in Economics.* ★3 (either term, 3-0-0).

ECON 900. *Non-thesis Project* ★3 (variable). Note: Formerly ECON 600.

44.14 English

44.14.1 JUNIOR COURSES

The English Department offers seven junior courses. Two are full-session courses: English 200 and English 210. Five are single-term courses: English 215, English 270, English 275, English 284 and English 290. Either of the full-session courses, or any two of the single-term courses, may serve as prerequisites to 300-level senior courses.

NOTE: Normally no more than one full-session junior English course, or equivalent, may be offered for credit in an undergraduate program.

All junior English courses will require a substantial amount of writing in essays and tests to afford practice in setting down ideas in good English. English 290 and English 210, in which the art of composition is taught, will require substantially more writing than the other junior courses.

The English Department strongly urges those students intending to make English Literature a subject of concentration to take English 200, as the best preparation for further studies in English.

ENGL 200. *A Survey of English Literature from the Middle Ages to the Twentieth Century.* ★6 (3-0-0). A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ENGL 210. *English Literary Forms.* ★6 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry, and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

ENGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0). A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265.

ENGL 270. *Readings in Poetry.* ★3 (either term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry. Prerequisite: ENGL 215.

ENGL 275. *Readings in Prose.* ★3 (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically. Prerequisite: ENGL 215.

ENGL 284. *Canadian Literature in Process.* ★3 (either term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English. Prerequisite: ENGL 215.

ENGL 290. *The Craft of Writing.* ★3 (Second Term, 3-0-0). A study of techniques of expository writing, intended to increase awareness of the resources of English prose, and to provide

intensive practice in using these. Prerequisite: ENGL 215 and consent of the Department.

44.14.2 SENIOR COURSES

NOTE: Senior courses have as prerequisite English 200, or 210, or any two single-term courses in English.

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

INT D 301. *The Hollywood Film.* ★ (3-0-3). See § 44.22. Accepted as an option only.

ENGL 309. *Expository Writing.* ★6 (3-0-0). The purpose of this course is to increase the student's ability to write clear expository prose. The study of models of prose style will be central, combined with frequent practice in writing on the basis of such models.

ENGL 310. *Introduction to Bibliography and Methods of Research.* ★3 (either term, 3-0-0). An examination of the development of printing, textual problems, library organization, bibliography compilation, and manuscript styles and methods.

ENGL 311. *History of the Language.* ★3 (either term, 3-0-0). An analysis of the historical development of the English language, with some study in the prose tradition. Note: Formerly part of ENGL 388.

ENGL 313. *The Modern English Language.* ★3 (either term, 3-0-0). A study of modern grammar, semantics, and stylistics. Note: Formerly part of ENGL 388.

ENGL 315. *History of English Literary Criticism.* ★3 (either term, 3-0-0). A survey of the major developments in literary criticism. Note: Formerly part of ENGL 393.

ENGL 316. *Chaucer.* ★6 (3-0-0). Major works of Chaucer and of selected poets of the fifteenth century.

ENGL 317. *Applied Criticism.* ★3 (either term, 3-0-0). A study of the practical application of critical principles and methods to English literature. Note: Formerly part of ENGL 393.

ENGL 318. *Traditions in English Poetry.* ★3 (either term, 3-0-0). The traditions, forms, and techniques of English poetry.

ENGL 320. *Old English Language and Literature.* ★6 (3-0-0). An introduction to the language and literature of Anglo-Saxon England. Note: Formerly ENGL 308.

ENGL 321. *The Earlier Middle Ages.* ★3 (either term, 3-0-0). The literature of England from its beginnings to the end of the thirteenth century. Note: Formerly part of ENGL 314.

ENGL 322. *The Later Middle Ages.* ★3 (either term, 3-0-0). The literature of fourteenth- and fifteenth-century England, including Chaucer. Note: Formerly part of ENGL 314.

ENGL 330. *The Early English Renaissance.* ★3 (either term, 3-0-0). The literature of sixteenth-century England, including Shakespeare, showing the influence of Renaissance ideas and literary forms. Note: Formerly part of ENGL 324.

ENGL 331. *The Later English Renaissance.* ★3 (either term, 3-0-0). The literature of seventeenth-century England, including Milton, in the light of intellectual developments of the period. Note: Formerly part of ENGL 344.

ENGL 332. *Shakespeare.* ★6 (3-0-0). A study of representative plays. Note: Not to be taken by students with credit in ENGL 333.

ENGL 333. *Shakespeare.* ★3 (either term, 3-0-0). Selected works of Shakespeare. Note: Not to be taken by students with credit in ENGL 332.

ENGL 335. *English Drama to 1642.* ★3 (either term, 3-0-0). Representative works by medieval and later dramatists including Shakespeare, showing the development of English drama. Note: Formerly part of ENGL 390.

ENGL 340. *Milton.* ★6 (3-0-0).

ENGL 341. *The Augustan Age.* ★3 (either term, 3-0-0). Representative works by writers from the Restoration and early eighteenth century. Note: Formerly part of ENGL 348.

ENGL 343. *The Age of Johnson.* ★3 (either term, 3-0-0). Works of representative writers of the later eighteenth century, including the precursors of Romanticism. Formerly part of ENGL 348.

ENGL 345. *The British Romantic Period.* ★3 (either term, 3-0-0). Representative works of the Romantic poets and related prose materials. Note: Not to be taken by students with credit in ENGL 356.

ENGL 350. *The Earlier Victorian Age.* ★6 (3-0-0). Representative works of the earlier Victorians. Note: Not to be taken by students with credit in ENGL 364 or 372. Formerly a single-term course.

ENGL 351. *The Later Victorian Age.* ★3 (Second Term, 3-0-0). Representative works of the later Victorians. Note: Not to be taken by students with credit in ENGL 364 or 372.

ENGL 355. *Drama from the Restoration to 1870.* ★3 (either term, 3-0-0). Representative works of Restoration and later dramatists, showing changes in the English drama. Note: Formerly part of ENGL 390.

ENGL 356. *Poetry and Prose of the Romantic Period.* ★6 (3-0-0). Readings in the Major Romantic Poets. Note: Not to be taken by students with credit in ENGL 345.

ENGL 357. *The English Novel.* ★6 (3-0-0). Representative novels by Defoe, Richardson, Fielding, Smollett, Sterne, Austen, Scott, Dickens, Thackeray, Bronte, Hardy, and others. Note: Formerly ENGL 392.

ENGL 358. *Currents of Thought in American Prose.* ★3 (either term, 3-0-0). Representative works of American writers from Colonial times to the present, illustrating the intellectual milieu. Note: Not to be taken by students with credit in ENGL 373.

ENGL 359. *American Fiction to 1900.* ★3 (either term, 3-0-0). Representative works. Note: Not to be taken by students with credit in ENGL 373.

ENGL 360. *The Modern American Novel.* ★3 (either term, 3-0-0). Representative works of twentieth century American novelists. Note: Not to be taken by students with credit in ENGL 383.

ENGL 361. *The Modern British Novel.* ★3 (either term, 3-0-0). Representative works of twentieth century British novelists. Note: Not to be taken by students having credit in ENGL 380.

ENGL 362. *Modern British and American Drama.* ★6 (3-0-0). Major works by modern British and American dramatists. Note: Formerly ENGL 391, not to be taken by students with credit in that course, or ENGL 363.

ENGL 363. *Modern Drama.* ★3 (either term, 3-0-0). Selected plays of British and American dramatists. Note: Not to be taken by students with credit in ENGL 391 or 362.

ENGL 364. *Modern Canadian Drama.* ★3 (either term, 3-0-0). Selected plays by dramatists of English-speaking Canada.

ENGL 365. *Modern Poetry.* ★3 (either term, 3-0-0). Representative works of British and American poets. Note: Not to be taken by students with credit in ENGL 380 or 383.

ENGL 366. *The Short Story.* ★3 (either term, 3-0-0). Representative works of writers illustrating the tradition of the short story in English.

ENGL 367. *The Canadian Literary Tradition: Rural.* ★3 (either term, 3-0-0). Representative works of writers of English-speaking Canada from 1800 to the present. Note: Not to be taken by students with credit in ENGL 384.

ENGL 369. *The Canadian Literary Tradition: Urban.* ★3 (either term, 3-0-0). Representative works of writers of English-speaking Canada. Note: Not to be taken by students having credit in ENGL 384.

ENGL 370. *Regional Literature of Canada.* ★3 (either term, 3-0-0). Representative works of writers of English-speaking Canada.

ENGL 371. *Experimental Writing in Canada.* ★3 (either term, 3-0-0). Representative works of writers of English-speaking Canada.

ENGL 372. *Studies in Victorian Prose of Thought.* ★6 (3-0-0). Representative works by Burke, Carlyle, J. S. Mill, Newman, Arnold, Ruskin, Huxley, Butler, and Morris. Note: Not to be taken by students having credit in ENGL 460.

ENGL 373. *American Literature to 1900.* ★6 (3-0-0). A selection of representative major writers. Emphasis on the writers of the "American Renaissance", especially Poe, Hawthorne, Emerson, Thoreau, Melville, Whitman, Mark Twain, and Henry James.

ENGL 374. *Commonwealth Literature.* ★3 (either term, 3-0-0). Representative works of writers from various areas of the Commonwealth. Note: Formerly part of ENGL 399.

ENGL 376. *Introduction to Creative Writing: Fiction.* ★3 (either term, 3-0-0). Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 377. *Introduction to Creative Writing: Poetry.* ★3 (either term, 3-0-0). Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 378. *Intermediate Creative Writing: Fiction.* ★3 (either term, 3-0-0). Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 379. *Intermediate Creative Writing: Poetry.* ★3 (either term, 3-0-0). Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 380. *Early Twentieth Century British Literature.* ★6 (3-0-0). Note: Not to be taken by students with credit in ENGL 361 or 365.

ENGL 383. *American Literature from 1900.* ★6 (3-0-0). A selection of representative major writers. Note: Not to be taken by students with credit in ENGL 360.

ENGL 384. *Canadian Literature.* ★6 (3-0-0). An historical and critical study of the literature of English-speaking Canada. Note: Not to be taken by students with credit in ENGL 367 or 369.

ENGL 385. *The King James Bible in English Literature.* ★6 (3-0-0). A literary study of selections from the Old and New Testaments of the King James Bible, and of the influence of the King James Bible in English literature.

44.14.3 SPECIAL STUDIES COURSES

NOTE: Special Studies Courses have as prerequisite one full-session 300-level English course or two single-term 300-level English courses, unless otherwise specified. Not all Special Studies Courses may be offered in any given year.

ENGL 407. *Creative Writing: Advanced Fiction.* ★6 (3-0-0). Prerequisites: Two 300-level courses, one of which is to be a creative writing course, and consent of the instructor.

ENGL 408. *Creative Writing: Advanced Poetry.* ★6 (3-0-0). Prerequisites: Two 300-level courses, one of which is to be a creative writing course, and consent of the instructor.

ENGL 411. *Studies in Individual Authors.* ★3 (First Term, 3-0-0).

ENGL 412. *Studies in Individual Authors.* ★3 (Second Term, 3-0-0).

ENGL 413. *Studies in Literary Genres.* ★3 (First Term, 3-0-0).

ENGL 414. *Studies in Literary Genres.* ★3 (Second Term, 3-0-0).

ENGL 415. *Studies in National Literatures in English.* ★3 (First Term, 3-0-0).

ENGL 416. *Studies in National Literatures in English.* ★3 (Second Term, 3-0-0).

ENGL 417. *Studies in Literary History.* ★3 (First Term, 3-0-0).

ENGL 418. *Studies in Literary History.* ★3 (Second Term, 3-0-0).

ENGL 423. *Studies in Literary Theory.* ★3 (First Term, 3-0-0).

ENGL 424. *Studies in Literary Theory.* ★3 (Second Term, 3-0-0).

ENGL 425. *Special Studies in English Language and Literature.* ★3 (First Term, 3-0-0).

ENGL 426. *Special Studies in English Language and Literature.* ★3 (Second Term, 3-0-0).

44.14.4 HONORS COURSES

ENGL 301. *Seminar, Second-Year Honors English.* ★2 (0-1s-0).

ENGL 302. *Directed Reading I. Second-Year Honors English.* ★6 (3-0-0).

ENGL 401. *Seminar, Third-Year Honors English.* ★2 (0-1s-0).

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). See § 44.22. Accepted as an option only.

ENGL 402. *Directed Reading II. Third Year Honors English.* ★6 (3-0-0).

ENGL 501. *Seminar, Fourth-Year Honors English.* ★2 (0-1s-0).

ENGL 502. *Directed Reading III. Fourth-Year Honors English.* ★6 (3-0-0).

ENGL 503. *Tutorial, Fourth-Year Honors English.* ★6. In the third year of the program the Honors English student, in consultation with the Department, will arrange for a literary project to be pursued under the guidance of a member of the Department for the ensuing summer and winter. The project will involve study of some problem having to do with such matters as technique, genre, criticism, or theme.

44.14.5 GRADUATE COURSES

ENGL 540. *The Theory and Practice of Expository Writing.* ★6 (3-0-0). Note: Restricted to students in the Postgraduate Diploma Program.

ENGL 541. *Forms of English Prose.* ★6 (3-0-0). Note: Restricted to students in the Postgraduate Diploma Porgram.

ENGL 542. *Forms of English Poetry.* ★6 (3-0-0). Note: Restricted to students in the Postgraduate Diploma Porgram.

ENGL 543. *Forms of English Drama.* ★6 (3-0-0). Note: Restricted to students in the Postgraduate Diploma Porgram.

ENGL 544. *The Canadian Literary Tradition.* ★6 (3-0-0). Note: Restricted to students in the Postgraduate Diploma Porgram.

ENGL 553. *Directed Reading.* ★6 (3-0-0).

ENGL 554. *Directed Reading.* ★3 (First Term, 3-0-0).

ENGL 555. *Directed Reading.* ★3 (Second Term, 3-0-0).

ENGL 560. *Bibliography and Methods of Research.* ★0 (1-0-0).

ENGL 567. *Studies in Literary History.* ★3 (either term, 3-0-0).

ENGL 568. *Literary Criticism.* ★6 (3-0-0).

ENGL 569. *Studies in Literary Criticism.* ★3 (either term, 3-0-0).

ENGL 576. *The English Language.* ★6 (3-0-0).

ENGL 577. *Studies in the English Language.* ★3 (either term, 3-0-0).

ENGL 584. *Creative Writing.* ★6 (3-0-0).

ENGL 586. *Studies in American Literature.* ★3 (either term, 3-0-0).

ENGL 587. *Nineteenth Century American Literature.* ★6 (3-0-0).

ENGL 589. *Twentieth Century American Literature.* ★6 (3-0-0).

ENGL 590. *Canadian Literature.* ★6 (3-0-0).

ENGL 591. *Studies in Canadian Literature.* ★3 (either term, 3-0-0).

ENGL 592. *Old Norse Literature.* ★6 (3-0-0).

ENGL 610. *Old English Literature.* ★6 (3-0-0).

ENGL 611. *Studies in Old English Literature.* ★3 (either term, 3-0-0).

ENGL 614. *Middle English Literature.* ★6 (3-0-0).

ENGL 615. *Studies in Middle English Literature.* ★3 (either term, 3-0-0).

ENGL 616. *Chaucer.* ★6 (3-0-0).

ENGL 628. *Medieval Drama.* ★6 (3-0-0).

ENGL 634. *Renaissance Literature.* ★6 (3-0-0).

ENGL 635. *Studies in Renaissance Literature.* ★3 (either term, 3-0-0).

ENGL 640. *Shakespeare.* ★6 (3-0-0).

ENGL 641. *Elizabethan and Jacobean Drama.* ★6 (3-0-0).

ENGL 646. *Seventeenth Century Poetry and Prose.* ★6 (3-0-0).

ENGL 647. *Studies in Seventeenth Century Literature.* ★3 (either term, 3-0-0).

ENGL 652. *Milton.* ★6 (3-0-0).

ENGL 654. *Restoration and Eighteenth Century Drama.* ★6 (3-0-0).

ENGL 658. *Restoration and Eighteenth Century Literature.* ★6 (3-0-0).

ENGL 659. *Studies in Restoration and Eighteenth Century Literature.* ★3 (either term, 3-0-0).

ENGL 660. *The Eighteenth Century Novel.* ★6 (3-0-0).

ENGL 662. *The Romantic Novel.* ★6 (3-0-0).

ENGL 663. *Romantic Literature.* ★6 (3-0-0).

ENGL 664. *Romantic Poetry.* ★6 (3-0-0).

ENGL 665. *Studies in Romantic Literature.* ★3 (either term, 3-0-0).

ENGL 670. *Currents of Thought in English Literature Since 1790.* ★6 (3-0-0).

ENGL 671. *Victorian Poetry.* ★6 (3-0-0).

ENGL 672. *The Victorian Novel.* ★6 (3-0-0).

ENGL 673. *Studies in Victorian Literature.* ★3 (either term, 3-0-0).

ENGL 676. *The Twentieth Century Novel.* ★6 (3-0-0).

ENGL 678. *Twentieth Century Prose.* ★6 (3-0-0).

ENGL 679. *Studies in Twentieth Century Literature.* ★3 (either term, 3-0-0).

ENGL 682. *Twentieth Century Poetry.* ★6 (3-0-0).

ENGL 684. *Twentieth Century Drama.* ★6 (3-0-0).

ENGL 692. *Technique of the Novel.* ★6 (3-0-0).

ENGL 693. *Studies in Literary Genres.* ★3 (either term, 3-0-0).

ENGL 694. *Studies in Literary Techniques.* ★3 (either term, 3-0-0).

ENGL 695. *Studies in Literary Themes.* ★3 (either term, 3-0-0).

ENGL 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0).

44.15 *French and French-Canadian Language and Literature*

Department of Romance Languages

44.15.1 FRENCH LANGUAGE AND LITERATURE

Junior Courses

NOTE: Only one of French 200, 201, 202, or 230 may be taken for credit.

FREN 100. *Beginners' French.* ★6 (4-0-1). Designed to enable students entering with complete matriculation but without French to begin their study of this language in the University. Note: Normally, students will go from FREN 100 to FREN 200.

FREN 200. *First-Year University French.* ★6 (3-0-1). Intensive training in spoken and written French, including grammar, composition, and literature. Prerequisite: French 30 or equivalent. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 220 or 222, or CA FR 220 or 222.

FREN 201. *First-Year University French For Teachers.* ★6 (3-0-2). Designed to teach future teachers of French to speak and to write the language. Three hours of grammar and two hours of audio-visual learning per week. Prerequisite: French 30 or equivalent. Note: Arts students must obtain permission of the Dean before registering in this course. Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 220 or 222, or CA FR 220 or 222.

FREN 202. *Intermediate First-Year University French.* ★6 (3-0-1). Designed for students having French 31 and Francophone students. Prerequisite: French 31 or equivalent. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 220 or 222, or CA FR 220 or 222.

FREN 205. *Basic Skills for Reading French.* ★3 (First Term, 3-0-0). A basic course in French grammar and literature designed to develop skills in reading French. Language of instruction is English. Prerequisite: French 30 or equivalent. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French.

FREN 206. *French Reading Comprehension.* ★3 (Second Term, 3-0-0). An intermediate course in French grammar and literature. Language of instruction is English. Prerequisite: FREN 205 or consent of the Department. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French.

FREN 230. *Advanced First-Year University French.* ★6 (3-0-2). Designed for Honors students. Students having French 31 and Francophone students require the consent of the Department.

Senior Courses

FREN 301. *Second-Year University French.* ★6 (3-0-2). Designed to perfect written and oral knowledge of French. The course aims at achieving adequate fluency to enable students to proceed in literature, translation and/or composition courses. Prerequisite: Any 200-level French course except FREN 205 or 206.

FREN 304. *Readings in French Literature before 1715.* ★3 (either term, 3-0-0). Selected periods and major works in French literature. The works are studied in French and the course is given in English. Prerequisite: FREN 200 or 206. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French. (Note: Formerly part of FREN 305.)

FREN 305. *Readings in French Literature after 1715.* ★3 (either term, 3-0-0). Selected periods and major works in French literature. The works are studied in French and the course is given in English. Prerequisite: FREN 200 or 206. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French.

FREN 306. *Readings in French Theatre.* ★3 (either term, 3-0-0). Selected periods and major works in French literature. The works are studied in French and the course is given in English. Prerequisite: FREN 200 or 206. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French.

FREN 307. *Readings in French Poetry.* ★3 (either term, 3-0-0). Selected periods and major works in French literature. The works are studied in French and the course is given in English. Prerequisite: FREN 306. Note: Not accepted to meet the requirements in a principal area of concentration, or the second area of concentration if the principal area is French.

FREN 308. *Second-Year French for Honors Language Students.* ★6 (3-0-2). Intensive study of grammar, idiom, and vocabulary with oral and written work. Prerequisite: FREN 230 or consent of the Department.

FREN 310. *Introductory French Composition for Honors Students.* ★3 (First Term, 3-0-0). Prerequisite: Any 200-level French or French-Canadian course, except the 200-level reading series.

FREN 312. *Practical Work in Oral French for Second-Year Honors Students.* ★2 (1-0-0). Note: Formerly FREN 302.

FREN 313. *Aspects of Contemporary French Civilization and Culture I.* ★3 (First Term, 3-0-0). The civilization and culture of France as seen through its institutions, customs, and writings. This course aims at improving the student's oral and written command of French. Prerequisite: Any 200-level or 300-level French or French-Canadian course, except FREN 205, 206, 304, 305, 306, or 307. Note: Formerly part of FREN 330. Not open to students having credit or registered in Faculté Saint-Jean FRANC 324.

FREN 314. *Aspects of Contemporary French Civilization and Culture II.* ★3 (Second Term, 3-0-0). The civilization and culture of France as seen through its institutions, customs, and writings. This course aims at improving the student's oral and written command of French. Prerequisite: Any 200- or 300-level French or French-Canadian course except FREN 205, 206, 304, 305, 306, or 307. Note: Formerly part of FREN 330. Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 324.

FREN 330. *Introduction to The Close Study of French Literary Texts.* ★3 (either term, 3-0-0). Prerequisite: Any 200-level French course except FREN 205 or 206. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 325.

FREN 340. *Composition, Grammar and Advanced Conversation.* ★6 (3-0-0). Development of writing skills through practice in prose composition. Intensive study of grammar. Advanced conversation based on a survey of selected texts. Prerequisite or corequisite: Any 200- or 300-level FREN or FR CA course except FREN 205, 206, 304, 305, 306, or 307. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 320 or 321. Note: Only one of FREN 340, or FR CA 340 may be taken for credit.

FREN 360. *Introduction to French Literature of the Eighteenth Century.* ★3 (either term, 3-0-0). Prerequisite or corequisite: FREN 330. Note: Formerly part of FREN 460. Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 326.

FREN 370. *Introduction to French Literature of the Nineteenth Century.* ★3 (either term, 3-0-0). Prerequisite or corequisite: FREN 330. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 327.

FREN 380. *Introduction to French Literature of the Twentieth Century.* ★3 (either term, 3-0-0). Prerequisite or corequisite: FREN 330. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 328.

FREN 390. *Introduction to Children's Literature in French.* ★3 (either term, 3-0-1). A survey of children's literature in French especially designed for future teachers of French. Prerequisite: any 300-level French or French-Canadian courses except the 300-level reading courses. Note: Normally restricted to Faculty of Education students. Arts students require permission of the Department to take this course.

FREN 400. *Comparative Stylistics: French-English.* ★6 (3-0-0). Prerequisite: R LIN 375 or consent of the Department. Note: Formerly R LIN 400. Not open to students with credit in R LIN 400, or having credit or registered in Faculté Saint-Jean CA FA 421 or 422.

FREN 408. *Third-Year French for Honors Language Students.* ★3 (either term, 3-0-2). Intensive advanced grammar, written and oral expression. Prerequisite: FREN 308 or consent of the Department. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 420.

FREN 409. *History of the French Language.* ★3 (either term, 3-0-0). Prerequisite: A reading knowledge of French. Note: Formerly FREN 512.

FREN 410. *French Composition I.* ★3 (First Term, 3-0-0). Prerequisite: FREN 310 or consent of the Department. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 322.

FREN 411. *French Composition II.* ★3 (Second Term, 3-0-0). Prerequisite: FREN 410. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 322.

FREN 412. *Practical Work in Oral French for Third-Year Honors Students.* ★2 (1-0-0). Note: Formerly FREN 403.

FREN 413. *Aspects of French Civilization and Culture III.* ★3 (First Term, 3-0-0). The civilization and culture of France from the Romans to the classic era. This course is designed to improve the student's oral and written command of French and to provide a context for the study of French literature. Prerequisite: Any French or French-Canadian 300-level course except 300-level reading series.

FREN 414. *Aspects of French Civilization and Culture IV.* ★3 (Second Term, 3-0-0). The civilization and culture of France from the end of the classic era to World War I. This course is designed to improve the student's oral and written command of French and to provide a context for the study of French literature. Prerequisite: Any French or French-Canadian 300-level course except the 300-level reading series.

FREN 415. *Exercises in Translation: French Into English.* ★3 (either term, 3-0-0). Prerequisite: A 300-level course in French or French-Canadian.

FREN 416. *Exercises in Translation: English Into French.* ★3 (either term, 3-0-0). Prerequisite: A 300-level course in French or French-Canadian.

FREN 430. *Introduction to Medieval French Literature.* ★3 (either term, 3-0-0). Prerequisite: Any one of FREN 360, 370, 380, or consent of the Department. Note: Formerly part of FREN 530.

FREN 431. *Topics in Medieval French Literature.* ★3 (Second Term, 3-0-0). Prerequisite: FREN 430. For Honors students or by consent of the Department. Note: Formerly part of FREN 530.

FREN 440. *Introduction to French Literature of the Renaissance.* ★3 (either term, 3-0-0). Prerequisite: Any one of FREN 360, 370, 380, or consent of the Department. Note: Formerly part of FREN 540.

FREN 441. *Topics in French Literature of the Renaissance.* ★3 (Second Term, 3-0-0). Prerequisite: FREN 440. For Honors students or by consent of the Department. Note: Formerly part of FREN 540.

FREN 450. *Introduction to French Literature of the Seventeenth Century.* ★3 (either term, 3-0-0). Prerequisite: Any one of FREN 360, 370, 380, or by consent of the Department.

FREN 451. *Topics in French Literature of the Seventeenth Century.* ★3 (Second Term, 3-0-0). Prerequisite: FREN 450. For Honors students or by consent of the Department.

FREN 461. *Topics in French Literature of the Eighteenth Century.* ★3 (Second Term, 3-0-0). Prerequisite: FREN 360. For Honors students or by consent of the Department. Note: Formerly part of FREN 460.

FREN 471. *Topics in French Literature of the Nineteenth Century.* ★3 (either term, 3-0-0). Prerequisite: FREN 370 or consent of the Department.

FREN 481. *Topics in French Literature of the Twentieth Century.* ★3 (either term, 3-0-0). Prerequisite: FREN 380 or consent of the Department.

FREN 499. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual students. Prerequisite: Any 300-level French or French-Canadian course.

Honors and Graduate Courses

FREN 500. *Reading Course.* ★6 (3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. Note: Not open to undergraduates.

FREN 508. *Fourth-Year French for Honors Language Students.* ★6 (3-0-2). Intensive advanced language work. Application, within specialized fields, of language skills. Prerequisite: FREN 408 or consent of the Department.

FREN 510. *Seminar in French Composition.* ★6 (0-3s-0). Intensive training in the preparation and oral presentation of reports in French. Note: For fourth-year Honors students.

FREN 515. *Advanced Exercises in Translation: French into English.* ★3 (either term, 3-0-0). Prerequisite: FREN 415.

FREN 516. *Advanced Exercises in Translation: English into French.* ★3 (either term, 3-0-0). Prerequisite: FREN 416.

FREN 520. *Honors Tutorial.* ★3 (either term, 3-0-0) or ★6 (3-0-0). For fourth-year Honors students.

FREN 521. *The History of French Literary Criticism to the Eighteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 522. *History of French Literary Criticism From the Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 531. *Studies in Medieval French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 600.

FREN 542. *Studies in the French Renaissance.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 551. *Studies in Seventeenth Century French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 550.

FREN 560. *Studies in Eighteenth Century French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 570. *Studies in the Romantic Period in France.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 470.

FREN 574. *Studies in French Realism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 475.

FREN 576. *Studies in French Prose and Poetry of the late Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 480.

FREN 580. *Studies in Twentieth Century French Theatre.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 581. *Studies in the Twentieth Century French Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 575.

FREN 582. *Studies in Twentieth Century French Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 685.

FREN 599. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual Honors or Graduate students. Prerequisite: Consent of Department.

FREN 611. *History of French Syntax: From Its Origins to 1500.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 602.

FREN 613. *History of French Syntax: From 1500 to the Present.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: FREN 611, or consent of the Department. Note: Formerly FREN 603.

FREN 622. *Seminar in French Theatre II.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly part of FREN 606.

FREN 623. *Seminar in French Poetry.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FREN 624. *Methods of Research.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 691.

FREN 625. *Bibliography and Thesis Style.* ★1 (First Term, 0-1s-0). Note: Formerly FREN 690.

FREN 626. *Seminar in French Literary Criticism.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly FREN 604.

FREN 632. *The Spirit of Humanism in France up to the Renaissance.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 612.

FREN 635. *Seminar in Medieval French Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Prerequisite: FREN 531 or consent of the Department. Note: Formerly FREN 605.

FREN 641. *Seminar in French Renaissance Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly FREN 610.

FREN 652. *Seminar in Seventeenth-Century Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly FREN 619.

FREN 662. *Seminar in Eighteenth-Century Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly FREN 629.

FREN 663. *The Eighteenth Century Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 630.

FREN 671. *The Naturalistic Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 651.

FREN 672. *Seminar in Nineteenth-Century Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Note: Formerly FREN 640.

FREN 675. *The Late Nineteenth-Century Theatre.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 655.

FREN 680. *Seminar in Twentieth-Century Literature.* ★6 (0-3s-0). Prerequisite: An undergraduate course in Twentieth-Century French literature. Note: Formerly FREN 660.

FREN 684. *Studies in the Contemporary French Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 661.

FREN 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 697. *Special Reading Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of a literary question not dealt with in the other Honors or graduate courses. Designed to meet the needs of individual Honors or Graduate students.

44.15.2 FRENCH-CANADIAN LANGUAGE AND LITERATURE

Senior Courses

FR CA 332. *Aspects of French-Canadian Civilization and Culture I.* ★3 (either term, 3-0-0). The eighteenth and nineteenth centuries as seen through representative authors. Practical work in grammar, composition and stylistics. Prerequisite: Any 200-level French course except FREN 205 or 206. Note: Formerly part of FR CA 331. Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 320.

FR CA 333. *Aspects of French-Canadian Civilization and Culture II.* ★3 (either term, 3-0-0). Contemporary French-Canadian civilization and culture as seen through representative authors. Practical work in composition. Prerequisite: Any 200-level course except FREN 205 or 206. Note: Formerly part of FR CA 331. Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 322.

FR CA 340. *Composition and Stylistics.* ★6 (3-0-0). This course is designed for Francophone students to improve their command of written French through intensive practice. Prerequisite: Any 200- or 300-level French or French-Canadian course except FREN 205, 206, 304, 305, 306, 307. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 320 or 321. Only one of FREN 340, or FR CA 340 may be taken for credit.

FR CA 352. *Introduction to French-Canadian Literature.* ★6 (3-0-0). Selections from representative traditional works and study of representative aspects of popular culture; practical work in conversation and phonetics. Prerequisite: Any 200-level French course except FREN 205 or 206.

FR CA 411. *Evolution of the French Language in Canada.* ★3 (either term, 3-0-0). Prerequisite: R LIN 374 or consent of the Department.

FR CA 440. *A Critical approach to "Quebecois" Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). The sources and evolution of nationalism in French-Canadian literature as reflected in the works of early and modern writers. Prerequisite: Any full-year 300-level French or French-Canadian literature course or equivalent except FREN 304 to 307.

FR CA 450. *Introduction to Nineteenth Century French-Canadian Literature.* ★3 (either term, 3-0-0). The novel and poetry in relation to dominant themes. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading series. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 450.

FR CA 451. *Twentieth Century French-Canadian Novel.* ★3 (either term, 3-0-0). The French-Canadian novel from the generation of 1890 to the birth of the new novel as seen through the major novelists of the period. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading series. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 451.

FR CA 465. *Twentieth Century French-Canadian Poetry.* ★3 (either term, 3-0-0). The major themes of French-Canadian poetry from Saint-Denys Garneau to Raoul Duguay. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading series. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 465.

FR CA 466. *Twentieth Century French-Canadian Theatre.* ★3 (either term, 3-0-0). The evolution of French-Canadian theatre from Gratien Gelines to Michel Tremblay. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading series. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean CA FR 466.

FR CA 497. *Contemporary French-Canadian Literature and Culture.* ★6 (3-0-0). Fiction and non-fiction in the Nineteenth and Twentieth Centuries. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading series.

FR CA 499. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual students. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading courses.

Honors and Graduate Courses

FR CA 501. *French-Canadian Literary History and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). An introduction to the major problems in literary history, theory and criticism. Prerequisite: Consent of the Department.

FR CA 597. *Readings in French-Canadian Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 599. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of a major author, genre or literary question. Prerequisite: Consent of the Department.

FR CA 600. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 624. *Seminar: Literature of New France.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 625. *Seminar: Nonfiction, 1760-1867.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 626. *Seminar: Nonfiction since 1867.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 627. *Seminar: Nineteenth Century Fiction.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 628. *Seminar: Nineteenth Century Poetry.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 629. *Seminar: Nineteenth Century Drama.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 630. *Seminar: Twentieth Century Fiction.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 631. *Seminar: Twentieth Century Poetry.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 632. *Seminar: Twentieth Century Drama.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 633. *Seminar: French-Canadian Literature of Western Canada.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 640. *Seminar: French and French-Canadian Literary Relations.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

FR CA 690. *Bibliography and Style.* ★1 (First Term, 0-1s-0).

FR CA 691. *Methods of Research.* ★3 (First Term, 3-0-0).

FR CA 699. *Graduate Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

Note: For additional courses related to French and French-Canadian, see Romance Linguistics in § 44.34 and Romance Literatures in § 44.35.

44.16 Geography

NOTE: Descriptions of Geography 230/231 and other Geography courses considered to be Science courses will be found in the Faculty of Science section of the Calendar (§ 184.12, below).

NOTE: STUDENTS ARE RESPONSIBLE FOR THEIR OWN ACCOMMODATION AND MEAL EXPENSES FOR GEOGRAPHY 470 WHICH INVOLVES AN OVERNIGHT FIELD TRIP.

Courses in Cartography and Meteorology offered within the Geography Department will be found in § § 184.7 and 184.21.

44.16.1 JUNIOR COURSES

GEOG 200. *General Geography.* ★6 (3-0-0). A survey course covering various aspects of Geography, including the physical, human, and regional. Note: Geography 200 and 230/231 may not both be offered for credit in the B.A. program. Not intended for students who plan to major in Geography. Geography 200 may not be offered for credit with any other 200-level course in Geography.

GEOG 250. *Spatial Organization of Human Activity.* ★3 (either term, 3-0-0). The search for order in man's occupation of the earth and of his distribution across it; maps as techniques for understanding reality.

GEOG 251. *Introduction to Cultural Geography.* ★3 (either term, 3-0-0). The significance of human distribution on the earth.

Man's relation to the physical environment; world population problems; cultural patterns in the world.

44.16.2 SENIOR COURSES

GEOG 335. *Contemporary Alberta: A Geographical Perspective.* ★3 (either term, 3-0-0). An examination of contemporary Alberta focussing on the spatial aspects of regional organization and associated rapid change, notably: metropolitan growth, urban spill-over, small town development, and rural readjustment.

GEOG 340. *Regionalization in Canada.* ★3 (either term, 3-0-0). The regional organization of Canadian life; the influence of variation in resources, geographical location, population, urbanization, industrialization, ethnic presence, and external relations in giving rise to regional differentiation in contemporary Canada. Note: Not open to students with credit in GEOG 400.

GEOG 341. *The Cultural Landscapes of the United States.* ★3 (either term, 3-0-0). The present-day landscapes of the United States seen as the product of the changes imposed on the natural environment by human efforts to create a satisfactory way of life. Note: Note open to students with credit in GEOG 400.

GEOG 344. *Introduction to Third World Geography.* ★3 (First Term, 3-0-0). An explanatory description of the ecological and cultural environments of Earth's non-temperate lands, and of the processes that shape their development, their continuing role as resource purveyors, with comparisons made between the tropics and other non-temperate landscapes.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.) Accepted as an option only.

GEOG 350. *Introduction to Economic Geography.* ★3 (either term, 3-0-0). Analysis of the locational characteristics of economic activities throughout the world. The significance of location and spatial arrangement with respect to the relationships between geography and economics. Prerequisite: GEOG 250 or a course in economics.

GEOG 354. *Population Geography.* ★3 (First Term, 3-0-0). Spatial patterns and variations in demographic characteristics and cultural qualities of human populations. Distribution, density, structure, movement, and growth of population studied with reference to the underlying social and economical processes. Note: See INT D for a complementary course.

GEOG 359. *Introduction to Behavioral Geography.* ★3 (Second Term, 3-0-0). Decision making in a spatial context. Responses to perceived social and physical environment.

GEOG 360. *Geography of Rural Canada.* ★3 (First Term, 3-0-0). The physical environment and the development of rural Canada; physical limits and economic margins; agricultural and rural development; the future for rural Canada.

GEOG 364. *The Influence of Man on the Natural Environment.* ★3 (either term, 3-0-0). Introduction to basic concepts necessary for a general understanding of processes whereby man initiates environmental change, intentionally and unintentionally.

GEOG 365. *Geography of Energy Resources.* ★3 (either term, 3-0-0). Geographic perspective on components and characteristics of renewable and non-renewable energy resources including their physical and spatial aspects, transportation, environmental impacts, energy use and conservation.

GEOG 366. *Water Resources in Developing Countries.* ★3 (either term, 3-0-0). The role of water in developing countries, especially in Asia, South America and Africa. Present and projected water requirements, demand and use, rural and urban supplies, quality, health, sanitation and decision-making.

GEOG 370. *Political Geography.* ★3 (First Term, 3-0-0). Origins and evolution of political geography and geopolitics; spatial aspects of the development of political territories, their boundaries and internal structures, state resources, natural, political and ethnic boundaries, international geopolitical relationships.

GEOG 380. *Settlement Geography.* ★6 (3-0-0). The geography of settlement, both rural and urban; regions and problems of pioneer settlement, materials and form of shelter in the geographic landscape, patterns of dispersed and agglomerated settlement, urbanization in the world.

GEOG 381. *Geography of the City.* ★3 (First Term, 3-0-0). Origin and spread of urban settlement; problems arising from the growth and form of metropolitan areas and inter-city systems.

GEOG 382. *Geography of Urban Canada.* ★3 (Second Term, 3-0-0). Spatial aspects of urban development in Canada with particular reference to current research and literature.

GEOG 416. *Introduction to Latin America.* ★3 (First Term, 3-0-0). Characteristics of the human impact on the Latin American landscape. Note: Formerly part of GEOG 442, not to be taken by students with credit in that course or in 443.

GEOG 417. *Contemporary Latin America.* ★3 (Second Term, 3-0-0). A study of problems in the development of modern Latin America as a geographic region. Note: Formerly part of GEOG 443, not to be taken by students with credit in that course or in 442.

GEOG 424. *Resource Conservation.* ★3 (Second Term, 3-0-0). Conservation and modern environmentalism as frameworks for describing, understanding, and coping with problems of resource scarcity and environmental quality. (Students are recommended but not required to take GEOG 364 in preparation for this course.)

GEOG 444. *Africa.* ★3 (Second Term, 3-0-0). Regional surveys of physical, human and economic patterns on a continent in transition. Analysis of its contemporary problems of development and of the geographic viability of its existing political units.

GEOG 446. *Northern Lands II.* ★3 (Second Term, 3-0-0). Regional survey of northern development, human and economic characteristics and problems in Alaska, northern Canada, Greenland and Scandinavia. Prerequisite: Consent of instructor.

GEOG 447. *Man in the Arid Lands.* ★3 (Second Term, 3-0-0). An analysis of environmental factors and problems of human adjustment associated with the world's dry lands in the low and mid-latitudes.

GEOG 448. *East-Central Europe.* ★3 (either term, 3-0-0). A survey of the natural features; spatial aspects of demographic and cultural changes; territorial settlement and economic activity in the countries of East-Central Europe. Analysis of current problems associated with regional development.

GEOG 449. *Western Canada.* ★3 (either term, 3-0-0). Resources, patterns of development, and regions of Western Canada. Emphasis on the developed parts of the Prairie Provinces and British Columbia.

GEOG 450. *Manufacturing Geography.* ★3 (either term, 3-0-0). A systematic survey of raw materials, markets, transportation, and other locational factors in their effect on patterns of manufacturing. Manufacturing location theory and empirical evidence on location decisions. Prerequisite: GEOG 350 or a course in economics.

INT D 455. *Migration.* ★3 (either term, 3-0-0). (See § 44.22.)

GEOG 458. *Transportation Geography.* ★3 (First Term, 0-3s-0). Basic concepts and principles of transportation geography with particular emphasis on the evolution and distribution of transport facilities; the role of transportation services in economic geography; and their significance in both interregional and intraregional interactions. Special emphasis on Canada.

GEOG 460. *Regional Development.* ★3 (Second Term, 3-0-0). Causes and attempted remedies for regional problems; growth poles and centres; the regional planning process; disadvantaged regions in Canada and other countries. Prerequisite: Any of the following: GEOG 350, 360, 450; ECON 316, 317, 318, 319, 334, 363; or consent of instructor.

GEOG 462. *Spatial Analysis.* ★3 (First Term, 3-0-0). Evaluation of the characteristics of location patterns. Location factors. Basic criteria employed to analyze spatial patterns. Analysis of patterns of spatial equilibrium, linkages, networks, movement and hierarchies. Prerequisite: Consent of instructor.

GEOG 470. *Political Geography of Canada.* ★3 (Second Term, 3-0-0). The geographical significance of territorial sovereignty, international and internal boundaries, electoral results, rural and metropolitan government reform, public service areas, national resource ownership, federal/provincial issues.

GEOG 471. *The Historical Geography of North America.* ★3 (either term, 3-0-0). The evolution of settlement patterns and the cultural landscape of North America from the end of Amerindian Times to the mid-twentieth century. Note: Not open to students with credit in GEOG 400.

GEOG 481. *Urban Geography.* ★3 (Second Term, 3-0-0). The geographer's approach to the study of urban phenomena; social and physical configurations; process and change within the urban areas; urban goals and attitudes. Prerequisite: GEOG 381 or SOC 353.

GEOG 482. *Field Methods in Urban Geography.* ★3 (Second Term, 3-0-0). Introduction to such techniques as questionnaire and interview surveys, trade area and economic base analysis, land use and other intra-city studies, the use of mapping techniques in these analyses; and their application to urban planning. Projects will be included. Prerequisite: GEOG 481, or GEOG 488 or consent of instructor.

GEOG 488. *Introduction to Urban Planning.* ★3 (First Term, 3-0-0). Planning theories and concepts of the Twentieth Century; practical applications in various parts of the world.

GEOG 489. *Physical Planning of the Canadian City.* ★3 (Second Term, 3-0-0). The impact of physical planning concepts and practice on the Canadian city; special reference to Alberta. Prerequisite: GEOG 488 or its equivalent.

GEOG 498. *Honors Seminar.* ★3 (First Term, 0-3s-0). Problems in contemporary geographic theory and practice. Prerequisite: Consent of instructor.

45.16.3 HONORS AND GRADUATE COURSES

GEOG 500. *History and Nature of Geography.* ★3 (Second Term, 0-3s-0). Geography from ancient times to the present; the most important geographers and an assessment of their contributions; significant current geographic concepts, current major developments within special branches of geography; geography in other countries. Prerequisite: Consent of instructor.

GEOG 502. *Reading and Seminar Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 506. *Scandinavia.* ★6 (0-3s-0). The regional geography of Norway, Sweden, Denmark, and Finland, with aspects of the historical, economic, and political geography of the area. Prerequisite: Consent of instructor.

GEOG 510. *Historical Geography.* ★3 (First Term, 0-3s-0). The development of historical geography and its relationship to geography and history; case studies in the geography of selected areas at given times in the past utilizing regional and topical approaches. Prerequisite: A previous course in geography or consent of instructor.

GEOG 523. *Geographic Theory.* ★3 (First Term, 3-0-0).

GEOG 542. *Seminar in the Geography of Latin America.* ★3 (Second Term, 0-3s-0). Topics vary from year to year.

GEOG 544. *Seminar on Africa.* ★6 (0-3s-0). A comparative regional study of the way in which the African landscapes, both physical and cultural, have assumed their present character since the Fifteenth Century. Special reference to the geographical ramifications of the problems confronting selected countries of Africa south of the Sahara.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.) Accepted as an option only.

GEOG 548. *Seminar on the Human Geography of East Central Europe.* ★3 (Second Term, 0-3s-0). Selected problems in the geography of East-Central Europe. Prerequisites: GEOG 448 or INT D 346 and consent of instructor.

GEOG 550. *Research in Regional Geography.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 552. *Research in Human Geography.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 553. *Special Research Problems.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 554. *Advanced Population Geography.* ★3 (Second Term, 3-0-0). Theoretical concepts and research methods in population geography. Data gathering and processing at micro, meso and macro scales. Case studies of population distribution, change and composition. Prerequisite: GEOG 354 or consent of instructor.

GEOG 558. *Research in Transportation Geography.* ★3 (Second Term, 3-0-0). Approaches to research in transportation geography. Consideration of transportation characteristics and problems. Models of development of transportation routes and networks.

GEOG 559. *Perception Research in Geography.* ★3 (either term, 3-0-0). Theoretical and practical relevance in urban, environmental, and resource management studies. Prerequisite: Consent of instructor.

GEOG 560. *Rural Development and Planning.* ★6 (0-3s-0). Spatial differences in economic conditions, delimitation and characteristics of "areas of economic stress," town and country planning legislation and rural development programs. Prerequisite: Consent of instructor.

GEOG 566. *Geography of Outdoor Recreation.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of instructor.

GEOG 580. *Seminar on Geography of Settlement.* ★6 (0-3s-0).

GEOG 581. *Physical Structure of the City.* ★3 (First Term, 0-3s-0). Analysis of form, functions and dynamics of urban physical space. Prerequisite: GEOG 481 or equivalent.

GEOG 582. *Social Geography of the City.* ★3 (Second Term, 0-3s-0). Social space and activity systems within the city. Prerequisite: GEOG 481 or equivalent.

GEOG 584. *The Geography of Market Centres and Marketing.* ★3 (Second Term, 3-0-0). Prerequisite: GEOG 481 or equivalent.

GEOG 588. *Political Urban Geography.* ★3 (First Term, 0-3s-0). The role of local government as an agent in the evolution of urban morphology; evaluation of the planning process. Prerequisite: One of GEOG 470, 481, 488, or consent of the Department.

GEOG 589. *Urban Land Use Planning.* ★3 (Second Term, 0-3s-0). Objectives and techniques of urban land use planning, with particular emphasis on Canadian experience. Prerequisite: GEOG 488 or consent of the Department.

GEOG 630. *Advanced Research in Regional Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). (See § 44.22.)

GEOG 680. *Advanced Research in Human Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GEOG 681. *Advanced Research in Urban Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GEOG 690. *Seminar on Geographic Thought.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 696. *Special Problems.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

44.17 German

Department of Germanic Languages

44.17.1 JUNIOR COURSES

GERM 100. *Conversational German for Beginners.* ★6 (3-0-2). Designed to lead to mastery of spoken and written German, with strong emphasis on the development of oral communication skills. Note: Not open to students with credit in German 30, GERM 101, or GERM 102.

GERM 101. *Intensive Beginners' German.* ★6 (3-0-2). Designed to develop practical skill in spoken and written German with special emphasis on the acquisition of an extensive vocabulary. Note: Especially for prospective Honors students, students with a concentration in German, and for students with some previous knowledge of German. Admission only with the consent of the Department.

GERM 102. *Reading German for Beginners.* ★6 (3-0-1). Designed to develop skill in written and spoken German, with strong emphasis on reading and listening comprehension. Note: Not open to students with credit in German 30, GERM 100, or GERM 101.

GERM 200. *First-Year University German.* ★6 (3-0-2). Designed to develop ability in speaking, reading, and writing German, using modern short stories, cultural readers, and audio-visual aids. Prerequisite: German 30, GERM 100, or the equivalent.

GERM 201. *Intensive First-Year University German.* ★6 (3-0-2). Designed to develop ability in speaking, reading and writing German with special emphasis on the writing skill. Prerequisite: German 30 or GERM 100 or 101 and consent of the Department. Note: Especially for prospective Honors students, students with a concentration in German and for students of native background in German who need special training in grammar and writing.

GERM 202. *Intermediate German.* ★6 (3-0-0). Designed to improve skill in reading and listening comprehension. Texts will exemplify German contributions to European intellectual life. Prerequisite: German 30, GERM 100, 101, 102, or the equivalent.

GERM 210. *Scientific German.* ★6 (3-0-0). An intensive course to give beginning students a reading knowledge of scientific German. Note: Not accepted for credit in B.A. programs. Not available to students with matriculation standing in German.

44.17.2 SENIOR COURSES

GERM 301. *Advanced German Grammar and Stylistics.* ★6 (3-0-0). Theoretical and practical study of the more complex areas of German grammar, style and idiomatic usage. Prerequisite: GERM 200, 201, 202 or consent of the Department.

GERM 306. *German-English Contrastive Phonology.* ★3 (First Term, 3-0-0). Phonetic and phonemic analysis of English and German. Contrastive study includes application to teaching and learning German. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 300.

GERM 307. *German-English Contrastive Grammar.* ★3 (Second Term, 3-0-0). Comparison of parts of the two grammars namely the verb, including application to teaching and learning German. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 300.

GERM 310. *Advanced Scientific German.* ★6 (3-0-0). Reading of advanced scientific and technical texts, supplemented by a systematic and thorough discussion of grammatical difficulties and "trouble makers" in German scientific literature. Prerequisite: German 30, GERM 100, 101, 102, 210 or their equivalent. Note: Students who pass GERM 310 with a grade of 6 or better will be considered by the Department as having fulfilled the reading requirement in German for the Ph.D. at The University of Alberta.

GERM 321. *German Prose in English Translation.* ★3 (First Term, 3-0-0). Analyses of great novels and novellas in English translation from the eighteenth century to contemporary times. Note: Not accepted to meet concentration requirements in German.

GERM 322. *German Drama in English Translation.* ★3 (Second Term, 3-0-0). Analyses of great dramas in English translation from the eighteenth century to contemporary times. Note: Not accepted to meet concentration requirements in German.

GERM 330. *German Culture and Civilization.* ★6 (3-0-0). Lectures and readings on German life, literature, and civilization. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 350. *Survey of German Literature.* ★6 (3-0-0). Selected periods and major works in German literature. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 370. *German Enlightenment and Sturm and Drang.* ★6 (3-0-0). The background of the *Aufklarung* and *Sturm und Drang,* with study of representative works. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 380. *German Classicism.* ★6 (3-0-0). The ideas and literature of German Classicism; the works of Goethe, Schiller, and Holderlin. Special emphasis on the works of Goethe. Prerequisite: GERM 200, 201, 202 or consent of the Department.

GERM 385. *German Romanticism.* ★6 (3-0-0). Historical and cultural background and literature of the German Romantic movement. Works of A. W. Schlegel, Friedrich Schlegel, Wackenroder, Novalis, Tieck, Brentano, Eichendorff, and E. T. A. Hoffmann. Prerequisite: GERM 200, 201, 202 or consent of the Department.

GERM 401. *German Literature of the "Restauration" Period.* ★3 (First Term, 3-0-0). A survey of the nineteenth century prose, poetry, and drama up to 1850 tracing developments from late Romanticism through the "Biedermeier" and "Jungdeutschland" movements. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 400.

GERM 402. *German Literature of Poetic Realism.* ★3 (Second Term, 3-0-0). A survey of the nineteenth century prose and drama after 1850; emphasizing works of Poetic Realism up to Naturalism. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 400.

GERM 406. *Introduction to German Linguistics.* ★3 (First Term, 3-0-0). Runes; discussion of major features of several Germanic languages. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 407. *History of New High German.* ★3 (Second Term, 3-0-0). Origin and development of modern standard German. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 411. *Middle High German Language.* ★3 (First Term, 3-0-0). An introduction to the grammar of Middle High German. Prerequisites: GERM 200, 201, 202, or consent of the Department.

GERM 412. *Middle High German Literature.* ★3 (Second Term, 3-0-0). An introduction to selected literary texts of classical Middle High German. Prerequisite: GERM 411, or consent of the Department.

GERM 421. *Medieval German Literature.* ★3 (First Term, 3-0-0). An introduction to the background and literature of the German Middle Ages (770-1500), with analysis of representative texts in modern German translation. Prerequisites: GERM 200, 201, 202, or consent of the Department.

GERM 422. *Renaissance, Reformation and Baroque German Literature.* ★3 (Second Term, 3-0-0). An introduction to the literature of the sixteenth and seventeenth centuries, with analysis of selected works. Prerequisites: GERM 200, 201, 202, or consent of the Department.

GERM 441. *Exercises in Translation: German into English.* ★3 (either term, 3-0-0). Theory and practice of translation of texts in contemporary and classical German literature. Prerequisite: GERM 301, or consent of the Department.

GERM 442. *Exercises in Translation: English into German.* ★3 (either term, 3-0-0). Practice of translations of texts from modern English literature. Prerequisite: GERM 301, or consent of the Department.

GERM 451. *Modern German Literature I.* ★3 (First Term, 3-0-0). Literature since Naturalism: Impressionism, with interpretation of representative works. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 450.

GERM 452. *Modern German Literature II.* ★3 (Second Term, 3-0-0). Literature since Impressionism: Expressionism and literature up to 1945, with interpretation of representative works. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 450.

GERM 456. *Contemporary German Prose.* ★3 (First Term, 3-0-0). An analysis and interpretation of selected novels and short stories since 1945, along with a discussion of the theory of the novel. Prerequisites: GERM 200, 201, 202, or consent of the Department.

GERM 457. *Contemporary German Drama.* ★3 (Second Term, 3-0-0). An analysis and interpretation of selected dramas and radio plays since 1945, along with a discussion of the theory of the modern drama. Prerequisites: GERM 200, 201, 202, or consent of the Department. Note: Formerly part of GERM 455.

GERM 460. *The Development of a Genre in German Literature.* ★6 (3-0-0). The novel, the *Novelle* or the drama, with interpretation of examples. Prerequisite: GERM 200, 201, 202, or consent of the Department.

GERM 497. *Special Topics in Germanic Linguistics and Philology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 498. *Special Topics in German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

44.17.3 HONORS AND GRADUATE COURSES

Before registering for these courses, students must consult the Department to ensure that they are qualified to undertake the work.

Courses and/or seminars marked ★3 or ★6 carry a weight of either 3 or 6 depending on the length of the course.

GERM 500. *Reading Course.* ★6 (3-0-0). This course is designed for graduate students who wish to satisfy the language requirement of their department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. Note: Not open to undergraduates.

GERM 505. *Seminar for Fourth-Year Honors Students.* ★6 (0-3s-0).

GERM 511. *Composition and Conversation.* ★3 (First Term, 3-0-0).

GERM 512. *Advanced Composition and Conversation.* ★3 (Second Term, 3-0-0).

GERM 515. *Teaching Strategies for College and University Teachers.* ★0 (1-0-2).

GERM 520. *Cultural and Political Topics in German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 540. *Old High German.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 550. *Gothic.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 560. *History of the German Language.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 580. *Comparative Germanic Grammar.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 590. *Old Saxon.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 593. *Bibliography and Methods of Literary Scholarship.* ★3 (First Term, 3-0-0).
GERM 603. *Early Middle High German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 604. *Studies in Middle High German Lyric Verse.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 605. *The Nibelungenlied.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 606. *Hartmann von Aue.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 607. *Wolfram von Eschenbach.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 609. *Gottfried von Strassburg.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 611. *Walther von der Vogelweide.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 612. *Late Middle High German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 613. *Early New High German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 615. *Studies in Seventeenth Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 616. *Studies in Eighteenth Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 617. *Lessing.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 618. *Enlightenment.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 619. *Sturm und Drang.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 620. *Classicism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 622. *Goethe.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 624. *Schiller.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 625. *Romanticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 626. *Studies in the Literature of the Age of Goethe.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 635. *Realism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 637. *Naturalism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 639. *Expressionism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 645. *Modern German Literature (up to 1945).* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 650. *Contemporary German Literature (from 1945 to the present).* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 655. *Studies in German Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 665. *Studies in the German Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 675. *Studies in the German Novelle.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 685. *Studies in German Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 696. *Conference Course in Germanic Linguistics and Philology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 697. *Special Topics in Germanic Linguistics and Philology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 698. *Special Topics in German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
GERM 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Detailed study of an author, period, genre, or any literary problem not dealt with in the Honors or Graduate courses listed above. Designed to meet the needs of individual Honors or Graduate students.
GERM 900. *Non-Thesis Project.* ★3 (variable).

44.18 Greek

Department of Classics

Note: For additional related courses see § § 44.9 and 44.25.

44.18.1 JUNIOR COURSE

GREEK 100. *Beginners' Greek.* ★6 (4-0-1). Essential grammar and vocabulary, the reading of easy Greek and simple sentences for translation into Greek.

44.18.2 SENIOR COURSES

GREEK 300. *Greek Authors and Prose Composition.* ★6 (3-0-1). Sight translation. Review of Greek forms. More difficult sentences for translation into Greek. Note: This course follows GREEK 100.
GREEK 311. *Grammar.* ★3 (either term, 3-0-0). A study of Greek grammar. Prerequisite: GREEK 300 or equivalent. Note: Restricted to Honors students.
GREEK 361. *Xenophon.* ★3 (either term, 3-0-0). Prerequisite: GREEK 300 or consent of the Department.
GREEK 371. *Herodotus.* ★3 (either term, 3-0-0). Selections from the History.
GREEK 372. *Thucydides.* ★3 (either term, 3-0-0). Selections from the Peloponnesian War.
GREEK 373. *Aeschylus.* ★3 (either term, 3-0-0).
GREEK 374. *Sophocles.* ★3 (either term, 3-0-0).
GREEK 375. *Euripides.* ★3 (either term, 3-0-0).
GREEK 376. *Greek Comedy.* ★3 (either term, 3-0-0). Selections from Aristophanes and / or Menander.
GREEK 377. *Greek Philosophical Authors.* ★3 (either term, 3-0-0). Selections from Plato and Aristotle.
GREEK 381. *Homer.* ★3 (either term, 3-0-0).
GREEK 411. *Greek Grammar and Style.* ★3 (2-0-0; 1-0-1). The writing of Greek prose. A single-term course offered over the full session.
GREEK 478. *Greek Oratory.* ★3 (either term, 3-0-0). Selections from Greek Orators. Note: Formerly GREEK 378.
GREEK 479. *Koine Greek I.* ★3 (either term, 3-0-0). Readings and studies in the New Testament and the Church Fathers and other Koine writings.
GREEK 480. *Koine Greek II.* ★3 (either term, 3-0-0). Readings and studies in the New Testament and Church Fathers and other Koine writings.

44.18.3 HONORS AND GRADUATE COURSES

GREEK 511. *Greek Grammar and Style.* ★3 (2-0-0; 1-0-1). Note: A single-term course offered over the full session.
GREEK 520. *History of the Greek Language I.* ★3 (First Term, 3-0-0). Prerequisite: GREEK 411, or 511, or equivalent.
GREEK 521. *History of the Greek Language II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 520.
GREEK 522. *Greek Epigraphy.* ★3 (either term, 3-0-0).
GREEK 523. *Greek Palaeography.* ★3 (either term, 3-0-0).
GREEK 524. *Hellenistic Poetry.* ★3 (either term, 3-0-0).
GREEK 525. *Hesiod.* ★3 (either term, 3-0-0).
GREEK 526. *Homer I.* ★3 (First Term, 3-0-0).
GREEK 527. *Homer II.* ★3 (Second Term, 3-0-0).
GREEK 528. *Lyric Poetry.* ★3 (either term, 3-0-0).
GREEK 529. *Pindar.* ★3 (either term, 3-0-0).
GREEK 530. *Greek Philosophical Authors I.* ★3 (First Term, 3-0-0).
GREEK 531. *Greek Philosophical Authors II.* ★3 (Second Term, 3-0-0).
GREEK 532. *Greek Tragedy I.* ★3 (First Term, 3-0-0).
GREEK 533. *Greek Tragedy II.* ★3 (Second Term, 3-0-0).
GREEK 534. *Greek Oratory I.* ★3 (First Term, 3-0-0).
GREEK 535. *Greek Oratory II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 534.
GREEK 536. *Greek Historiography I.* ★3 (First Term, 3-0-0).
GREEK 537. *Greek Historiography II.* ★3 (Second Term, 3-0-0).
GREEK 538. *Greek Comedy I.* ★3 (First Term, 3-0-0).
GREEK 539. *Greek Comedy II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 538.

GREEK 540. *Koine and Later Authors I.* ★3 (First Term, 3-0-0).
GREEK 541. *Koine and Later Authors II.* ★3 (Second Term, 3-0-0).
GREEK 542. *Studies in Greek Literature I.* ★3 (First Term, 3-0-0).
GREEK 543. *Studies in Greek Literature II.* ★3 (Second Term, 3-0-0).
GREEK 544. *Readings in Greek History I.* ★3 (First Term, 3-0-0).
GREEK 545. *Readings in Greek History II.* ★3 (Second Term, 3-0-0).
GREEK 546. *Readings in Hellenistic History I.* ★3 (First Term, 3-0-0).
GREEK 547. *Readings in Hellenistic History II.* ★3 (Second Term, 3-0-0).
GREEK 598. *Supervised Reading.* ★3 (either term, 3-0-0).
GREEK 599. *Supervised Reading.* ★3 (either term, 3-0-0).
GREEK 642. *Studies in Greek Literature A.* ★3 (either term, 3-0-0).
GREEK 643. *Studies in Greek Literature B.* ★3 (either term, 3-0-0).
GREEK 698. *Conference Course.* ★3 (either term, 3-0-0).
GREEK 699. *Conference Course.* ★3 (either term, 3-0-0).

44.19 *Hebrew*

Department of Classics

44.19.1 JUNIOR COURSE

HEB 100. *Introductory Classical Hebrew.* ★6 (3-0-2). Basic grammar of Hebrew and selected reading from the documents of the Pentateuch.

44.19.2 SENIOR COURSES

HEB 300. *Intermediate Classical Hebrew.* ★6 (3-0-0). Basic grammar (continued) with readings from the Prophets and other writings of the Hebrew Bible. Prerequisite: HEB 100 or consent of the Department.
HEB 400. *Advanced Classical Hebrew.* ★6 (3-0-0). Further readings from the Hebrew Bible and other selected documents. Prerequisite: HEB 300 or consent of the Department. Note: This course will not be offered until 1982-83.

44.20 *Hispanic Languages and Literatures*

Department of Romance Languages

44.20.1 SPANISH

Junior Courses

SPAN 100. *Beginners' Spanish.* ★6 (4-0-1). Spanish grammar and pronunciation; an introduction to Spanish and Hispano-American civilization.
SPAN 201. *Second-Year Honors Laboratory Hour.* ★2 (1-0-0).

Senior and Advanced Courses

SPAN 300. *Second-Year Spanish.* ★6 (3-0-1). Intensive grammar, composition, and conversation; an introduction to the reading of Spanish literature. Prerequisite: SPAN 100 or equivalent.
SPAN 302. *Third-Year Honors Language Seminar.* ★2 (0-1s-0).
SPAN 307. *Conversation and Composition I.* ★3 (either term, 3-0-0). Exercises in conversation and composition based on a survey of the principal historical periods and literary movements influencing the formation and development of Hispanic culture from the Medieval period to the Renaissance. Corequisite: SPAN 300. Note: Not open to students with credit in SPAN 304.
SPAN 308. *Conversation and Composition II.* ★3 (either term, 3-0-0). Exercises in conversation and composition based on a survey of the principal historical periods and literary movements influencing the formation and development of Hispanic culture from the Golden Age to the present. Corequisite: SPAN 300. Note: Not open to students with credit in SPAN 306.
SPAN 315. *Spanish Nineteenth Century Peninsular Literature.* ★3 (either term, 3-0-0). Literature of the Nineteenth Century studied through a number of selected works. Prerequisites: SPAN 300 or 304 and 306.
SPAN 320. *Spanish Twentieth Century Peninsular Literature.* ★3 (either term, 3-0-0). Literature of the Twentieth Century studied through a number of selected works. Prerequisites: SPAN 300 or 304 and 306.
SPAN 350. *Spanish-American Literature of the Colonial Period and the Nineteenth Century.* ★3 (either term, 3-0-0). A survey of the development of Spanish-American literature during the Colonial and National periods to the end of the Nineteenth Century. Prerequisite: SPAN 300 or 304 and 306. Note: Formerly part of SPAN 340.
SPAN 355. *Spanish-American Literature of the Twentieth Century.* ★3 (either term, 3-0-0). A survey of the development of Spanish-American literature in the Twentieth Century. Prerequisite: SPAN 300, or 304, and 306. Note: Formerly part of SPAN 340.
SPAN 400. *Advanced Composition, Translation and Reading.* ★3 (either term, 3-0-0). Prerequisite: SPAN 300. Note: Formerly part of SPAN 405.
SPAN 403. *Fourth-Year Honors Language Seminar.* ★2 (0-1s-0).
SPAN 410. *Spanish Medieval Literature.* ★3 (either term, 3-0-0). Prerequisite: SPAN 315 or 320 or 350 or 355.
SPAN 415. *Prose Writers of the Golden Age.* ★3 (either term, 3-0-0). Prerequisite: SPAN 315, or 320, or 350, or 355. Note: Formerly part of SPAN 460.
SPAN 420. *Poetry of the Golden Age.* ★3 (either term, 3-0-0). Prerequisite: SPAN 315, or 320, or 350, or 355. Note: Formerly part of SPAN 460.
SPAN 425. *Theatre of the Golden Age.* ★3 (either term, 3-0-0). Prerequisite: SPAN 315, or 320, or 350, or 355. Note: Formerly part of SPAN 460.
SPAN 450. *Topics in Spanish-American Literature.* ★3 (either term, 3-0-0). Prerequisite: SPAN 315 or 320 or 350 or 355.
SPAN 499. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A course designed to meet the needs of individual students in relation to some topic of study not covered in the other available courses at the same level. Prerequisite: Consent of the Department.

Honors and Graduate Courses

SPAN 500. *Reading Course.* ★6 (3-0-0). An intensive study of essential grammar, reading of graded texts from the student's own field. Designed for graduate students who wish to satisfy the language requirement of their department. Note: Not open to undergraduates.
SPAN 501. *Teaching Strategies for the Instruction of Spanish.* ★0 (First Term, 1-1-0). Note: This course is open only to Graduate Assistants in Spanish.
SPAN 503. *Spanish Dialectology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 510. *Spanish Semantics and Lexicography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 512. *History of the Spanish Language.* ★3 (either term, 3-0-0). Note: Formerly SPAN 540, a full-session course.
SPAN 550. *Medieval Narrative Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 560. *Medieval Spanish Prose.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 565. *Medieval Lyric Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 590. *Seminar in Golden Age Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).
SPAN 595. *Literary Theory in the Golden Age.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Literary ideas of the leading theoreticians of the Golden Age, such as Pinciano, Carvallo, Cascales, Gonzales de Salas, et al.
SPAN 600. *The Literature of the Discovery, Conquest and Colonization of America.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 610. *The Sentimental Romances and the Books of Chivalry. The Pastoral and Moresque Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 611. *The Dialogue Novel, from Rojas' "La Celestina" to Lope's "La Dorotea".* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 612. *The Picaresque Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 615. *Cervantes.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 620. *Sixteenth Century Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
SPAN 624. *Lope de Vega.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 626. *Tirso de Molina and Juan Ruiz de Alarcón.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 627. *Calderón.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 630. *The Romancero.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 633. *The Poetry of the Baroque Period.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 635. *Góngora.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 640. *Quevedo and Gracián.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 650. *The Novel, Poetry, and Drama of the Eighteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 660. *The Romantic Movement.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 665. *Galdós and his Contemporaries.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 669. *The "Modernista" Movement.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 670. *Contemporary Spanish Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 671. *Contemporary Spanish Novelists.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 672. *Contemporary Spanish American Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 673. *Contemporary Spanish-American Novelists.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 674. *Seminar in Spanish-American Literature.* ★3 (either term, (0-3s-0). or ★6 (0-3s-0).

SPAN 675. *Unamuno.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 690. *Problems of Criticism in Hispanic Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of some great author or literary question not dealt with in other Honors or Graduate courses. Designed to meet the needs of individual Honors or Graduate students.

44.20.2 CATALAN

CATLN 501. *Catalan.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Introduction to spoken and written modern Catalan, with reference to historical developments in older stages of the language.

CATLN 685. *Seminar on Medieval Catalan Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

CATLN 690. *Seminar on Contemporary Catalan Literature.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

44.20.3 PORTUGUESE

PORT 502. *Portuguese.* ★3 (either term, 3-0-0). Introduction to modern Portuguese.

Note: For additional courses related to Hispanic Languages, see Romance Linguistics in § 44.34 and Romance Literatures in § 44.35.

44.21 History

Only one of History 200, 201, or 202 may be taken for credit. For Ancient History see Classics, § 44.9

44.21.1 JUNIOR COURSES

HIST 200. *European History.* ★6 (3-1s-0). The evolution of European society from the decline of the Roman Empire in the West to the present.

HIST 201. *European History since the Renaissance.* ★6 (3-0-0).

HIST 202. *Introduction to Medieval Europe.* ★6 (3-0-0). Europe from the fall of Rome to the Renaissance.

HIST 204. *Studies in the Political and Social History of Europe.* ★3 (either term, 3-0-0). A course dealing with four or five particular historical topics from the fall of Rome to 1914 using an integrated text and monograph studies.

HIST 205. *An Introduction to Modern Intellectual History.* ★3 (either term, 3-0-0). A survey of major trends in European intellectual history since the Enlightenment.

HIST 206. *Introduction to the History of Women.* ★3 (either term, 3-0-0). This course is an introduction to the study of woman's history. It will examine the position of women in western societies from the Middle Ages to the Twentieth Century.

HIST 278. *An Introduction to the Study of Canadian History 1500-1867.* ★3 (First Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian History.

HIST 279. *An Introduction to the Study of Canadian History 1867-1967.* ★3 (Second Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian History.

HIST 280. *Asia to 1500.* ★3 (either term, 3-0-0). A survey of the history of Asia to the beginning of the sixteenth century.

HIST 281. *Asia From 1500.* ★3 (either term, 3-0-0). A survey of the history of Asia from the sixteenth century. Prerequisite: HIST 280 or consent of the department.

Note: The above courses are designed to provide a foundation for senior and advanced history courses, and also background for studies in related humanities and social sciences.

44.21.2 SENIOR COURSES

HIST 300. *Medieval Europe.* ★6 (3-0-0).

HIST 302. *Early Medieval Europe 338-1050.* ★3 (either term, 3-0-0). Note: Formerly a full-session course.

HIST 303. *Later Medieval Europe.* ★3 (either term, 3-0-0). The disintegration of the Medieval Empire and the emergence of national consciousness.

HIST 304. *Europe in the Age of the Renaissance and Reformation.* ★6 (3-0-0). Note: Students with credit in HIST 306 or 307 may not take this course for credit.

HIST 306. *The Renaissance.* ★3 (either term, 3-0-0). Note: Students with credit in HIST 304 may not take this course for credit.

HIST 307. *Europe in the Sixteenth Century.* ★3 (either term, 3-0-0). Note: Students with credit in HIST 304 may not take this course for credit.

HIST 309. *Revolutionary and Nineteenth Century Europe.* ★6 (3-0-0).

HIST 310. *Twentieth Century Europe.* ★6 (3-0-0).

HIST 311. *History of International Relations since 1939.* ★6 (3-0-0).

HIST 312. *Diplomatic History of Modern France..* ★3 (either term, 3-0-0). A study of France's foreign relations and colonial policy with emphasis on the period since 1870.

HIST 313. *Social History of Modern France.* ★3 (either term, 3-0-0). An examination of the changes in French society since the Revolution.

HIST 314. *Europe in the Seventeenth Century.* ★3 (either term, 3-0-0).

HIST 315. *Europe in the Eighteenth Century.* ★3 (either term, 3-0-0).

HIST 316. *The History of Ukrainians in Canada.* ★3 (either term, 3-0-0).

HIST 317. *France in Revolution, 1760-1870..* ★3 (either term, 3-0-0). An introduction to the history of France from the origins of the French Revolution to the downfall of Napoleon III. Note: Formerly part of HIST 320, not to be taken by students with credit in that course.

HIST 318. *France Since 1870.* ★3 (either term, 3-0-0). An introducation to political, economic and social developments in France from the Third to the Fifth Republic. Note: Formerly part of HIST 320, not to be taken by students with credit in that course.

HIST 319. *Italy.* ★3 (either term, 3-0-0). A survey of Italian history since the Renaissance.

HIST 323. *Medieval Russia.* ★3 (First Term, 3-0-0). Note: Formerly part of HIST 324.

HIST 325. *Imperial Russia.* ★3 (Second Term, 3-0-0). Prerequisite: HIST 323. Note: Formerly part of HIST 324.

HIST 326. *The Soviet Union.* ★6 (3-0-0). A historical survey of domestic and foreign policy since 1917.

HIST 329. *The Weimar Republic.* ★3 (either term, 3-0-0).

HIST 330. *History of Social and Political Ideas in Western Europe in the Nineteenth Century.* ★3 (either term, 3-0-0). A survey of major political, socio-economic ideas and movements since the Enlightenment.

HIST 331. *History of Social and Political Ideas in Western Europe in the Twentieth Century.* ★3 (Second Term, 3-0-0).

HIST 332. *Foundations of East European History.* ★3 (First Term, 3-0-0). The ethnic, religious, social, and political factors which shaped the development of the peoples of East Central Europe from the Middle Ages through the Age of Enlightenment.

HIST 334. *Ancient and Medieval Ukraine.* ★3 (First Term, 3-0-0). The social, political, and cultural development of Ukrainian lands from prehistory through the Fifteenth Century. The impact of the Normans, Byzantium, and the Steppe Nomads.

HIST 335. *Ukraine in Early Modern Times.* ★3 (First Term, 3-0-0). Ukraine in the Polish-Lithuanian commonwealth. The rise of the Cossacks and their confrontations with the Turko-Tartars, Poland, and Muscovy. Religious controversies and cultural trends in the age of the Baroque. Note: Formerly part of HIST 327.

HIST 336. *Nineteenth Century Ukraine.* ★3 (Second Term, 3-0-0). The Ukrainian people in the Russian and Austro-Hungarian empires. From serfdom to capitalism. The national movement and the making of the modern nation. Note: Formerly part of HIST 328.

HIST 337. *Twentieth Century Ukraine.* ★3 (Second Term, 3-0-0). World War I and the emergence of the Ukrainian Republic. Ukrainian lands in the U.S.S.R. and Poland during the interwar period. World War II and Nazi occupation. Soviet Ukraine since 1945.

HIST 338. *History of the Byzantine Empire.* ★3 (either term, 3-0-0).

HIST 339. *Eastern Europe since World War I.* ★3 (either term, 3-0-0). The recent history of Eastern Europe.

HIST 340. *Social and Economic History of Europe.* ★6 (3-0-0).

HIST 341. *The Social History of Medieval Europe.* ★3 (either term, 3-0-0).

HIST 342. *History of the Holy Roman Empire.* ★3 (either term, 3-0-0). The rise and decline of the Holy Roman Empire from Charlemagne to its fall in 1806. Note: Formerly part of HIST 322.

HIST 343. *Germany Since Frederick the Great.* ★3 (either term, 3-0-0). A survey of modern German history from Frederick the Great (1740) to the defeat of Hitler in 1945. Note: Formerly part of HIST 322.

HIST 345. *Early Modern Intellectual History of Western Europe.* ★3 (either term, 3-0-0). The main currents of Western thought from the late Renaissance to the Napoleonic era.

HIST 346. *English Constitutional History (Medieval).* ★3 (either term, 3-0-0). Note: Formerly part of HIST 351.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.) Accepted as an option only.

HIST 347. *English Constitutional History (Modern).* ★3 (either term, 3-0-0). Note: Formerly part of HIST 351.

HIST 348. *Tudor Britain.* ★3 (either term, 3-0-0). Note: Formerly part of HIST 354.

HIST 349. *Stuart Britain.* ★3 (either term, 3-0-0). Note: Formerly part of HIST 354.

HIST 350. *British History.* ★6 (3-0-0). A survey of the history of the British Isles to 1914.

HIST 352. *The British Empire and Commonwealth.* ★6 (3-0-0).

HIST 353. *British Medieval History.* ★6 (3-0-0). A survey from Roman times to 1485.

HIST 356. *Britain in the 18th Century.* ★3 (either term, 3-0-0).

HIST 357. *The Industrial Revolution in Britain.* ★3 (either term, 3-0-0). The main focus of this survey will be on the social and economic development of Britain during the Industrial Revolution, 1750-1850; concomitant changes in the politics and intellectual climate. Note: Not open to students with credit in ECON 312.

HIST 358. *Britain as a World Power.* ★3 (either term, 3-0-0). A survey from the end of the Napoleonic Wars to the mid-Twentieth Century.

HIST 359. *Eastern Europe in the Nineteenth Century.* ★3 (either term, 3-0-0). History of the area, from the Napoleonic War to World War I; the Polish question; the evolution of the Habsburg Empire; formation of nation-states in the Balkans.

HIST 360. *American History.* ★6 (3-0-0). A survey of United States history from colonial times to the present.

HIST 361. *The Westward Expansion of the United States.* ★3 (Second Term, 3-0-0). A survey of America's frontier experience, its economic, political, and social aspects, and its heritage. Prerequisite: A course in American History or consent of the Department.

HIST 362. *History of the Negro in the United States.* ★6 (3-0-0). The History of Black Americans from their introduction as slaves to the rise of the present Black Power movement.

HIST 364. *History of American Economic Life.* ★3 (either term, 3-0-0). A survey of American economic problems and policies in their historical setting.

HIST 365. *The Early National Period of American History.* ★3 (First Term, 3-0-0). A course covering in detail the political and economic problems of the United States, 1763-1848. Prerequisite: Any course in American history or the consent of the Department.

HIST 366. *Twentieth Century America.* ★3 (either term, 3-0-0). Emphasis on the relation between the nature of the modern political system in the United States and major social problems. Prerequisite: Any course in American history or consent of the Department.

HIST 369. *History of U.S. Foreign Relations.* ★3 (either term, 3-0-0). A survey of the international issues in the American past and the factors influencing the formation and application of U.S. policy. Prerequisite: HIST 360 or consent of the Department.

HIST 370. *Topics in the Social and Intellectual History of English Canada Since 1760.* ★3 (either term, 3-0-0). A survey of the major themes in English-Canadian social and intellectual history.

HIST 371. *The Canadian West to 1870.* ★3 (First Term, 3-0-0). A lecture course emphasizing the history of the prairie west but dealing as well with westward expansion and the north and with the trans-mountain west.

HIST 372. *The Canadian West Since 1870.* ★3 (Second Term, 3-0-0).

HIST 373. *The History of Upper Canada and of Canada West, 1784-1864.* ★3 (either term, 3-0-0). The history of the founding and development of the English-speaking colony in the interior of the North American continent.

HIST 374. *French Canada to Confederation.* ★3 (either term, 3-0-0).

HIST 375. *French Canada Since Confederation.* ★3 (either term, 3-0-0).

HIST 376. *History of Canada Since 1914.* ★3 (either term, 3-0-0).

HIST 377. *Topics in the History of Canadian External Relations.* ★3 (either term, 3-0-0). A survey of the impact of the United States and Great Britain on Canadian development.

HIST 378. *History of Canada from Confederation to the First World War.* ★3 (either term, 3-0-0).

HIST 379. *The Native Aspect of Canada's History.* ★3 (either term, 3-0-0). Canada's history as it relates to native peoples, from the beginning of the sixteenth century to the present. Prerequisite: A half course in Canadian history or consent of the Department. Note: ANTHR 350 or 355 strongly recommended.

HIST 380. *East Asia.* ★6 (3-0-0). A survey of the histories of China, Japan and Korea.

HIST 381. *Japan.* ★6 (3-0-0).

HIST 383. *China.* ★6 (3-0-0).

HIST 384. *South Asia.* ★6 (3-0-0). A survey of the history of the sub-continent of India from the Indus Valley civilization to the present.

HIST 385. *History of Science and Technology in China.* ★3 (either term, 3-0-0). The development of science and technology in China from earliest times to the present. Note: Formerly "Tropical Africa", a full session course.

HIST 386. *South East Asia.* ★6 (3-0-0). A survey of the history of South East Asia from the earliest times with emphasis on selected topics.

HIST 387. *Canada's Relations with East Asia.* ★3 (either term, 3-0-0). A survey of Canada's contacts with China, Japan, Korea, and Vietnam from the mid-nineteenth century to the present.

HIST 388. *Twentieth Century China.* ★3 (either term, 0-3s-0). The history of China from the Boxer Revolt to the present.

HIST 391. *Colonial Latin America.* ★3 (either term, 3-0-0). A survey of Latin American history. Note: Formerly part of HIST 390.

HIST 392. *Modern Latin America.* ★3 (either term, 3-0-0). A survey of Latin American history since 1810. Note: Formerly part of HIST 390.

HIST 393. *Iberian History.* ★3 (First Term, 3-0-0). A survey of Spanish and Portuguese history.

HIST 395. *History of Science and Technology.* ★6 (3-0-0). The nature of science and technology. The scientific process, the origins of the scientific tradition and the emergence of science. The scientific and industrial revolutions; discovery and invention in response to intellectual, social, political, and commercial needs, and pressures. The evolution of the major scientific disciplines and of technology from antiquity to the present; the interdependence of science and technology through the ages; the natural and social sciences in our time; prediction of possible future trends.

HIST 398. *The History of Human Conflict.* ★6 (3-0-0). A course designed as an introduction to the history of one of man's least attractive, but most consequential activities.

44.21.3 ADVANCED COURSES

The following courses are normally conducted as seminars and the precise topics covered in any given course may vary from year to year. Some account, therefore, may be taken of the particular interests of students within the framework of the course.

Normally, students who take these courses are expected to have at least two previous full-session courses in History; if they do not, they must obtain the consent of the Department prior to their registration, and the Department will consider their special needs. For some courses there are additional specified requirements.

HIST 400. *Topics in Medieval European History.* ★6 (0-3s-0).

HIST 401. *Topics in Byzantine History.* ★3 (either term, 0-3s-0).

HIST 403. *Topics in the History of Medieval France.* ★6 (0-3s-0).

HIST 404. *Renaissance and Reformation.* ★6 (0-3s-0).

HIST 405. *Topics in Canadian Native History.* ★3 (either term, 0-3s-0). Selected topics in Canadian history that relate to native peoples. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 406. *The History of Ethnic Settlement In Canada.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian History or consent of the Department.

HIST 407. *Topics in Alberta History.* ★3 (either term, 0-3s-0). Selected economic, social, and political topics with particular reference to the land and people of Alberta, beginning with native-white contact and extending to the present. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 408. *Topics in Canadian Social History.* ★3 (either term, 0-3s-0). Selected topics in the social history of Canada, with the major emphasis on English Canada in the nineteenth and twentieth centuries. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 409. *Topics in Canadian Intellectual History.* ★3 (either term, 0-3s-0). An examination of various aspects of Canadian thought in the period after 1867. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 410. *Introduction to Theoretical History.* ★3 (either term, 0-3s-0). Analysis of modern schools of theoretical history since Vico (early Enlightenment).

HIST 411. *Topics in American History.* ★3 (either term, 0-3s-0).

HIST 412. *Topics in American History.* ★3 (either term, 0-3s-0).

HIST 413. *Revolution in the Modern World to 1900.* ★3 (either term, 0-3s-0).

HIST 414. *Twentieth Century Revolutions.* ★3 (either term, 0-3s-0). Note: Formerly part of HIST 413.

HIST 415. *War in the Modern World.* ★3 (either term, 0-3s-0). A seminar course on the evolution of civil-military relations in the dynastic national and totalitarian states, with an analysis of the nature, uses, and limits of military, naval, and air power in their historical contexts.

HIST 419. *Paris in Revolution. 1787-1871.* ★6 (5-0-10). A study "on location" of the French Revolution and of subsequent revolutionary events in the national capital during the Nineteenth Century in the context of urban development from the Old Regime through the creation of the modern city under Napoleon III. Prerequisite: One course in European history or consent of the Department. (Note: This course is given in Paris during the Summer Session only. A knowledge of French, though useful, is not required. Those interested may obtain a brochure from the Department of History giving further information, or are invited to consult personally with the instructor, Dr. F. A. de Luna.)

HIST 421. *Topics in Modern German History before 1870.* ★6 (0-3s-0).

HIST 424. *Topics in Soviet History.* ★3 (either term, 0-3s-0).

HIST 425. *Topics in Ukrainian History.* ★3 (either term, 0-3s-0).

HIST 426. *The Intellectual History of Russia Since 1762.* ★3 (either term, 0-3s-0).

HIST 427. *Topics in Russian History from Kievan Times to the Present.* ★3 (either term, 0-3s-0).

HIST 428. *Eastern Europe since 1800.* ★3 (either term, 0-3s-0).

HIST 429. *Topics in the History of Germany since 1870.* ★6 (0-3s-0).

HIST 431. *Topics in the History of Modern France to 1789.* ★6 (0-3s-0).

HIST 432. *Topics in the History of Modern France since 1789.* ★6 (0-3s-0).

HIST 433. *Topics in the History of Twentieth Century France.* ★3 (either term, 0-3s-0). Prerequisite: HIST 320 or consent of the Department.

HIST 434. *Karl Marx, Historian.* ★3 (either term, 0-3s-0). The emphasis will be on Marx's historical method, as exemplified in such works as *The Class Struggles in France.*

HIST 435. *The French Revolution.* ★3 (either term, 0-3s-0).

HIST 436. *Nineteenth Century France.* ★3 (either term, 0-3s-0).

HIST 438. *Enlightenment and Revolution in Europe and America 1740-1815.* ★3 (either term, 0-3s-0).

HIST 439. *Germany Since 1933.* ★3 (either term, 0-3s-0).

HIST 440. *Topics in Modern European Social History.* ★3 (either term, 0-3s-0).

HIST 441. *Topics in the Intellectual History of Europe Since 1800.* ★3 (either term, 0-3s-0).

HIST 442. *Topics in the Intellectual History of Europe, Since the Late Nineteenth Century.* ★3 (either term, 0-3s-0).

HIST 444. *Women in Modern European History.* ★3 (either term, 0-3s-0).

HIST 445. *The European Community.* ★3 (either term, 0-3s-0). The origins, development and aspirations of the drive for European unity since 1945, with particular attention to the Treaty of Rome. Prerequisite: HIST 310 or 311.

HIST 446. *Topics in the History of Weimar Germany.* ★3 (Second Term, 0-3s-0). Prerequisites: HIST 329, 342/343, or consent of the Department.

HIST 447. *History of European Socialism.* ★3 (either term, 0-3s-0). A lecture/seminar course with emphasis on the Nineteenth Century.

HIST 448. *Topics in the History of Nineteenth Century French Canada.* ★3 (either term, 0-3s-0). The nineteenth century Canadian experience from a French Canadian perspective. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 449. *Topics in the History of Twentieth Century French Canada.* ★3 (either term, 0-3s-0). The Twentieth Century Canadian experience from a French Canadian perspective. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 451. *Topics in English Medieval History.* ★6 (0-3s-0).

HIST 452. *Topics in Tudor and Stuart History.* ★6 (0-3s-0).

HIST 454. *English Society in the Nineteenth Century.* ★6 (0-3s-0).

HIST 456. *British Foreign Policy 1815-1956.* ★6 (0-3s-0). A lecture/seminar course on the structure, content and effect of British foreign policy with particular attention being paid to the evolution of the decision making processes, pressure groups, critics, etc.

HIST 457. *Topics in British Economic History Since 1714.* ★3 (either term, 0-3s-0). A study of the growth and changing structure of the British economy. Prerequisites: HIST 350, or 357, or ECON 312, or consent of the Department.

HIST 458. *Topics in British Social History Since 1714.* ★3 (either term, 0-3s-0). A study of the condition of the poor in Britain using the case study method. Prerequisite: HIST 350, or 357, or consent of the Department.

HIST 460. *Topics in American Westward Expansion.* ★3 (First Term, 0-3s-0). Prerequisite: HIST 361 or consent of the Department. Note: Formerly part of HIST 461.

HIST 461. *Topics in Comparative North American History.* ★3 (either term, 0-3s-0). The emphasis will be on legal, social, and political issues. Prerequisite: At least one course in either Canadian or United States history.

HIST 462. *The Gilded Age in America.* ★3 (either term, 0-3s-0). Topics in the late nineteenth century U.S.

HIST 463. *American History to 1876.* ★3 (Second Term, 0-3s-0). Prerequisite: HIST 365 or consent of the Department. Note: Formerly part of HIST 465.

HIST 464. *Topics in the History of American Economic Life.* ★3 (either term, 0-3s-0). A seminar on selected problems in American economic history.

HIST 465. *Comparative Settlement Frontiers.* ★3 (Second Term, 0-3s-0). Comparative studies of the U.S., Canadian, South African, Australian, and New Zealand Frontiers. Prerequisite: HIST 352, 371, 372, or consent of the Department.

HIST 466. *Issues in Modern America.* ★3 (either term, 0-3s-0). Note: A full course prior to 1976.

HIST 467. *Topics in American Social History.* ★3 (either term, 0-3s-0).

HIST 468. *The Development of American Thought.* ★6 (0-3s-0).

HIST 469. *American Foreign Policy.* ★3 (either term, 0-3s-0).

HIST 470. *The Canadian West to 1870.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian History or consent of the Department.

HIST 471. *The Canadian West Since 1870.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian History or consent of the Department.

HIST 472. *Topics in The History of Canada to 1791.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 473. *Topics in The History of Canada, 1791-1867.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

INT D 475. *The Family in Socio-Historical Perspective.* ★3 (either term, 3-0-0). (See § 44.22.) Accepted as an option only.

HIST 476. *Topics in Canadian Business History.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 477. *Topics in the History of Canadian External Relations.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 478. *The Canadian North.* ★3 (either term, 0-3s-0). A topical approach to the history of northern Canada. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 479. *Topics in Canadian History.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 480. *Topics in East Asian History.* ★6 (0-3s-0).

HIST 481. *Topics in Early East Asian History.* ★6 (0-3s-0). Prerequisite: HIST 380, 381, or 383, or consent of the Department.

HIST 482. *Topics in Modern East Asian History.* ★6 (0-3s-0). Prerequisite: HIST 380, or 381, or 383, or consent of the Department.

HIST 484. *Topics in South East Asian History.* ★3 (either term, (0-3s-0). Prerequisite: A previous course in Asian history and consent of the Department.

HIST 486. *Topics in British Empire and Commonwealth History.* ★6 (0-3s-0).

HIST 487. *Topics in South Asian History.* ★3 (either term, 0-3s-0). Bangladesh, India, Pakistan, or Sri Lanka. Prerequisite: A previous course in Asian history or consent of the Department.

HIST 490. *Topics in Comparative History of Western Europe in the Eighteenth Century.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

HIST 491. *Topics in Comparative History of Western Europe in the Nineteenth Century.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

HIST 492. *Topics in the Political and Constitutional History of Canada since Confederation.* ★3 (either term, 0-3s-0). Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 493. *Land and Labor in Latin America.* ★3 (First Term, 0-3s-0). An examination of the history of labor utilization and its relationship to the various agricultural systems of Latin America. Prerequisites: HIST 391/392 or consent of the Department.

HIST 494. *Political and Social Revolution in Latin America.* ★3 (Second Term, 0-3s-0). An examination of political instability in Nineteenth Century Latin America and the circumstances surrounding social revolutions in Mexico and Cuba in the Twentieth Century. Prerequisites: HIST 391/392 or consent of the Department.

HIST 495. *Topics in Latin American History to 1850.* ★3 (First Term, 0-3s-0). Prerequisites: HIST 391/392 or consent of the Department.

HIST 496. *Topics in Latin American History since 1850.* ★3 (Second Term, 0-3s-0). Prerequisites: HIST 391/392 or consent of the Department.

HIST 497. *Topics in Comparative History.* ★3 (either term, 0-3s-0).

44.21.4 HONORS AND GRADUATE COURSES

HIST 498. *Introduction to Historiography for Honors Students.* ★3 (0-1.5s-0).

HIST 501. *Special Subject, Fourth-Year Honors History.* ★6 (0-3s-0). Preparation of the Honors essay, required in the fourth year of the Honors program.

HIST 509. *Latin America (Comprehensive).* ★6 (0-3s-0).

HIST 511. *Medieval British History (Comprehensive).* ★6 (0-3s-0).

HIST 512. *Modern British History (Comprehensive).* ★6 (0-3s-0).

HIST 513. *Canadian History (Comprehensive).* ★6 (0-3s-0).

HIST 514. *American History (Comprehensive).* ★6 (0-3s-0).

HIST 515. *Medieval European History (Comprehensive).* ★6 (0-3s-0).

HIST 516. *European History, 1500-1789 (Comprehensive).* ★6 (0-3s-0).

HIST 517. *European History, since 1789 (Comprehensive).* ★6 (0-3s-0).

HIST 518. *Russian and East European History (Comprehensive).* ★6 (0-3s-0).

HIST 519. *British Empire and Commonwealth History (Comprehensive).* ★6 (0-3s-0).

HIST 520. *East Asian History (Comprehensive).* ★6 (0-3s-0).

NOTE: Courses 521 to 590 inclusive are bibliographical seminars.

HIST 521. *Medieval Europe.* ★6 (0-3s-0).

HIST 523. *Early Modern Western Europe.* ★6 (0-3s-0).

HIST 525. *Modern Western Europe.* ★6 (0-3s-0).

HIST 527. *Russia and Eastern Europe.* ★6 (0-3s-0).

HIST 531. *Modern European Intellectual History.* ★6 (0-3s-0).

INT D 540. *Seminar on Comparative, Legal, Constitutional, and Federal Studies.* ★6 (0-3s-0). (See § 44.22.) Accepted as an option only.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.) Accepted as an option only.

HIST 552. *Medieval England.* ★6 (0-3s-0).

HIST 554. *Early Modern England.* ★6 (0-3s-0).

HIST 556. *Modern England.* ★6 (0-3s-0).

HIST 558. *British Empire and Commonwealth.* ★6 (0-3s-0).

HIST 560. *United States.* ★6 (0-3s-0).

HIST 570. *Canada.* ★6 (0-3s-0).

HIST 580. *East Asia.* ★6 (0-3s-0).

HIST 582. *China.* ★6 (0-3s-0). Bibliographical seminar for honors and graduate students specializing in the area.

HIST 583. *Japan and Korea.* ★6 (0-3s-0). Bibliographical seminar for honors and graduate students specializing in the area.

HIST 584. *Southeast Asia.* ★6 (0-3s-0). Bibliographical seminar for honors and graduate students specializing in the area.

HIST 590. *Latin America.* ★6 (0-3s-0). A bibliographical seminar.

HIST 599. *Directed Study.* ★6 (0-3s-0). Note: For students in the fourth year of the Honors program.

HIST 600. *Conference Course.* ★6 (0-3s-0). Directed studies in special subjects to meet individual requirements.

HIST 601. *Documentary Chinese for Historians.* ★6 (0-3s-0). Prerequisite: Previous training in the Chinese language and consent of the Department.

HIST 602. *Philosophy of History and Historical Methodology.* ★6 (0-3s-0). Note: Required of all candidates for higher degrees in History.

HIST 603. *Documentary Japanese for Historians.* ★6 (0-3s-0). Prerequisite: Previous training in the Japanese language and consent of the Department.

HIST 604. *Historical Interpretations.* ★6 (0-3s-0).

HIST 605. *Research Seminar.* ★3 (either term, 0-3s-0). The specific area of research is announced by the Department in the term before the seminar is offered.

HIST 607. *Methods of Quantification for Historians.* ★6 (either term, 0-3s-0).

HIST 608. *Studies in Comparative History.* ★6 (0-3s-0). Studies in select topics in comparative historical institutions and ideas. Topics to be announced annually.

HIST 611. *Topics in European Diplomatic History 1870-1945.* ★6 (0-3s-0).

HIST 612. *Topics in Modern German History.* ★6 (0-3s-0).

HIST 621. *Medieval Europe.* ★6 (0-3s-0).

HIST 623. *Early Modern Western Europe.* ★6 (0-3s-0).

HIST 625. *Modern Western Europe.* ★6 (0-3s-0).

HIST 627. *Russia and Eastern Europe.* ★6 (0-3s-0).

HIST 631. *Modern European Intellectual History.* ★6 (0-3s-0).

HIST 632. *Revolutionary Movements in France 1789-1914.* ★6 (0-3s-0).

HIST 652. *Medieval England.* ★6 (0-3s-0).

HIST 654. *Early Modern England.* ★6 (0-3s-0).

HIST 656. *Modern England.* ★6 (0-3s-0).

HIST 658. *The British Empire.* ★6 (0-3s-0).

HIST 660. *The United States.* ★6 (0-3s-0).

HIST 670. *Canada.* ★6 (0-3s-0).

HIST 672. *Seminar in the History of the Canadian West.* ★6 (0-3s-0).

HIST 680. *East Asia.* ★6 (0-3s-0).

HIST 682. *China.* ★6 (0-3s-0). Directed research for graduate students specializing in the area.

HIST 683. *Japan and Korea.* ★6 (0-3s-0). Directed research for graduate students specializing in the area.

HIST 684. *Southeast Asia.* ★6 (0-3s-0). Directed research for graduate students specializing in the area.

HIST 690. *Latin America.* ★6 (0-3s-0). A research seminar.

44.22 Interdisciplinary Studies

Courses listed below are the joint concern of the departments stated in the course descriptions. Students may register in these courses either as options or as courses in subjects of concentration in the departments or subjects specified unless otherwise indicated in the respective subject listings (§ § 44.1-44.40). Instruction will be offered by members of one or more of the departments or faculties listed. Responsibility for registration is with the department shown in italics. For additional information please consult that department or other participating departments.

44.22.1 SENIOR COURSES

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). An interdisciplinary survey (lecture and laboratory) of major areas in film studies, emphasizing history, theory, and criticism. Prerequisite: One year of ENGL 200-level, or ART H 201 and 202, or C LIT 200 or 300, or PHIL 240, or equivalent. [Art and Design, Comparative Literature, Drama, English, *Philosophy,* Political Science, and Romance Languages.] Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option.

INT D 301. *The Hollywood Film.* ★6 (3-0-3). A survey of the American feature film from the silent era to the present. Prerequisite: INT D 300. [Art and Design, Comparative Literature, Drama, English, *Philosophy,* Political Science, and Romance Language] Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option.

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth, and adjustment in agriculture. Prerequisites: ECON 201/202. Note: Formerly INT D 367. [Economics, *Rural Economy*].

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). A survey of world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities. Prerequisites: ECON 201/202. Note: Formerly INT D 368. [Economics, *Rural Economy*].

INT D 341. *Romania and Romanians.* ★3 (Second Term, 3-0-0). Included in the course is the history of Romania, the nature of its language, and the social, political, cultural, and economic development of Romania, and of Romanian settlements, especially those in the Moldavian SSR and in Canada. [*Division of East European Studies*].

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). An interdisciplinary introduction to the study of the socialist system with special reference to the Soviet Union and East Europe. [*Division of East European Studies* and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology.]

INT D 347. *Women and Socialism: USSR and Eastern Europe.* ★3 (Second Term, 3-0-0). Theory and practice of socialism as related to the status of women in Eastern Europe and the Soviet Union. Prerequisite: Consent of the Division of East European Studies. Note: Not open to students who have taken POL S 342 in 1977-78. [*Division of East European Studies* and Departments of Political Science, and Sociology].

INT D 355. *Social Problems of Eastern Europe Under State Socialism.* ★3 (3-0-0). The socio-cultural and economic consequences of major structural transformations in East European societies, with particular emphasis on family life, the socialization of youth, work relations, popular culture, and social deviance. [*Division of East European Studies*].

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: R SOC 355, or SOC 202, or 403, or equivalent. [Sociology, *Rural Economy*].

INT D 357. *Health Care Economics.* ★3 (either term, 3-0-0). Resource allocation in the health care industry; production and cost relationships within various types of institutional settings (hospital, medical firm) the role of the price mechanism in allocating resources. Manpower planning; the role of the Government and professional groups in allocating resources in the non-price sector of the health industry. [Economics, *Health Services Administration*].

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). Economic implications of outdoor recreation resource development and use. Prerequisite: ECON 201 or equivalent; ECON 202 recommended. [*Rural Economy,* Economics, Forest Science and Recreation Administration]

INT D 369. *Economics of the Environment.* ★3 (either term, 3-0-0). Economic growth and the deterioration of the environment; types and causes of environmental deterioration; theory, policy, and measurement relating to environmental deterioration; recreation economics; and current Canadian environmental topics. Prerequisite: ECON 201, or 304, or 307. [*Economics,* Rural Economy].

INT D 393. *Political Sociology.* ★3 (either term, 3-0-0). An examination of the impact of social organization and structure on the conduct of politics in mass societies, and of the ways the organization and structures of such societies are affected by political processes. Prerequisite: POL S 200, or 201, and 202; or SOC 202, or 403 or consent of the Department. [either *Political Science,* or Sociology].

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). Investigation of the problems of understanding and evaluating film. Includes close analysis of film extracts in class. Prerequisite: INT D 300. Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option. [Art and Design, Comparative Literature, Drama, English, *Philosophy,* Political Science, and Romance Languages]

INT D 443. *The Soviet North and Siberia.* ★3 (Second Term, 3-0-0). The economy, political administration, and the social development of the native peoples of Siberia and the Soviet North. Prerequisite or corequisite: An area-related course in

one of Geography, Political Science, Economics, or consent of the Division of East European Studies. (Participating units normally include *Division of East European Studies*, and Departments of Anthropology, Economics, and Geography).

INT D 444. *The Ukraine.* ★3 (Second Term, 3-0-0). Major social, economic, political, and cultural trends in the Ukrainian SSR in the post-World War II period. Prerequisite or corequisite: An area-related course in one of geography, history, political science, or Ukrainian, or consent of the Division of East European Studies. (Participating units normally include *Division of East European Studies,* and Departments of History, and Slavic Languages).

INT D 445. *Poland.* ★3 (First Term, 3-0-0). The political, social, economic, and cultural developments in post World War II. Prerequisite: INT D 346, or POLSH 304, or equivalent, or demonstration to the Division of East European Studies of sufficient background in the area. (Participating units normally include *Division of East European Studies,* and Departments of Economics, Fine Arts, Geography, Slavic Languages, and Sociology).

INT D 446. *Eastern Europe: A Travel-Study Course.* ★6 (5-0-15). An intensive interdisciplinary study of Eastern Europe and the Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Spring or Summer Session in countries of Eastern Europe and the U.S.S.R. on a selected basis and includes intensive study in one or more countries. Prerequisite: INT D 346 or consent of Division. Pre-session study and preparation. [*Division of East European Studies*].

INT D 455. *Migration.* ★3 (either term, 3-0-0). Internal and international migration, and its relationship to resources, economic opportunities, and societal organization in Canada and other countries; concepts, measures, and analytical techniques; determinants and consequences of migration; types and models of migration; adjustment of migrants; migration, and urban and metropolitan growth. [Geography, *Sociology*].

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). Social problems in Canadian rural life; analysis of policy making processes related to these problems. Prerequisite: Consent of instructor; INT D 356 recommended. [Sociology, *Rural Economy*].

INT D 458. *Socioeconomic Development of Western Canadian Agriculture.* ★3 (First Term, 3-0-0). The economic and social origins of western Canadian agricultural development. A chronological examination of farm and political organizations and other agrarian social movements influencing the farming sector. The growth of public policy and development of the institutional framework supporting agriculture. Discussion of past and present issues in Western Canadian agricultural development, including such factors as land settlement, transportation and farming support services. Prerequisite: R SOC 355, or SOC 202, or 403, or equivalent. [*Rural Economy* and Sociology].

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). The history, origins, foundation and definitions of community development. [*Sociology,* Community Development].

INT D 468 *Principles of International Humanitarian Law.* ★3 (either term, 3-0-0). Historical background; humanitarian intervention; human rights; law of war; international criminal law. Prerequisite: Consent of Faculty of Law or Department of Political Science. Note: Formerly IN ST 486. [*Political Science*].

INT D 475. *The Family in Socio-Historical Perspective.* ★3 (either term, 3-0-0). Comparative study of the family in socio-historical context with emphasis on North American and European family systems. Critical examination of contemporary sociological family theory in relation to historical data. Issues in socio-historical research methods of family study. Prerequisite: SOC 371 or equivalent. [History, *Sociology*].

INT D 478. *The Multinational Corporation and Public Policy.* ★3 (First Term, 3-0-0). The development and role of large corporations within North American and European capitalism, with particular reference to the Canadian experience. A historical outline is followed by a selection of material on imperialism, international relations, international trade, and commercial organization, designed to expose problems of public policy and shifts in social and economic power arising from the emergence of the multinational corporation. Prerequisite: Consent of the Department. [*Economics,* Political Science].

INT D 479. *The Multinational Corporation and Public Policy: Case Studies.* ★3 (Second Term, 3-0-0). Prerequisite: INT D 478. [*Economics,* Political Science].

44.22.2 HONORS AND GRADUATE COURSES

INT D 500. *Nature of Man.* ★6 (0-3s-0). A seminar comparing the various conceptions of the nature of man held by sociologists, psychologists, biologists, philosophers, theologians, writers, and artists, and exploring some of the major social and philosophical issues which confront man today from the prospectives of these disciplines. [*Philosophy,* Psychology].

INT D 540 *Seminar on Comparative, Legal, Constitutional, and Federal Studies.* ★6 (0-3s-0). Prerequisite: Consent of the Department. [History, *Political Science*].

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar. [*Division of East European Studies* and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology].

INT D 566. *Resource Economics II: Economics of the Environment.* ★3 (either term, 3-0-0). Economic theory and policy relating to resource and environmental quality problems; welfare and public policy issues in resource decision-making; the relationships between economic growth and environmental preservation; externalities and public goods; economics of pollution; recreation economics; selected Canadian environmental issues. [*Economics*].

INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0). An examination of the contributions of philosophy and psychology to the behavioral sciences. [Philosophy, *Psychology*]

INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0). An examination of the contributions of philosophy and psychology to the behavioral sciences. [Philosophy, *Psychology*]

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). [*Geography,* Sociology].

44.23 Italian

Department of Romance Languages

44.23.1 JUNIOR COURSES

ITAL 100. *Beginners' Italian.* ★6 (3-0-2) Italian grammar and pronunciation. Readings of easy texts dealing with different aspects of Italian culture. Note: This course is not open to students having some previous knowledge of Italian or any of its dialects. See ITAL 200.

ITAL 200. *First Year University Italian.* ★6 (3-0-0). Designed for students having some previous knowledge of Italian.

ITAL 201. *Second Year Honors Laboratory Hour.* ★2 (0-0-1).

44.23.2 SENIOR COURSES

ITAL 300. *Second Year Italian.* ★6 (3-0-0). Selected contemporary prose and poetry. Advanced grammar and phonetics. Prerequisite: ITAL 100. Note: Students who have completed ITAL 200 must have special permission from the Department in order to enrol in this course.

ITAL 302. *Third Year Honors Language Seminar.* ★2 (0-1s-0).

ITAL 321. *Contemporary Italian Novel, before 1945.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 200 or 300. Note: Formerly part of ITAL 320.

ITAL 322. *Contemporary Italian Novel, post-Second World War.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 200 or 300. Note: Formerly part of ITAL 320.

ITAL 331. *Contemporary Italian Short Stories, before 1945.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 200 or 300. Note: Formerly part of ITAL 330.

ITAL 332. *Contemporary Italian Short Stories, post-Second World War.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisite: ITAL 200 or 300. Note: Formerly part of ITAL 330.

ITAL 340. *A Survey of Italian Literature.* ★6 (3-0-0). Major literary works in Italian from the Sicilian school to the present. Prerequisite: ITAL 320, and 330, or consent of the Department.

ITAL 350. *Italian Literature in English Translation.* ★6 (3-0-0). The origins of the sonnet and the *canzone;* Dante's *Divine Comedy;* the works of Petrarch; the lyric madrigal; the early novelists from Boccaccio to Masuccio; new concepts of drama: *commedia dell' arte, commedia erudita,* and early opera texts; Platonist writers and the arts; Ficino, Leonardo da Vinci, Michelangelo; the Renaissance epic of Ariosto and Tasso; Marinismo and the Baroque.

ITAL 361. *Italian Theatre up to the Eighteenth Century.* ★3 (either term, 3-0-0). Comedy of the sixteenth century and the theatre of the seventeenth century. Prerequisites: ITAL 321, 322, 331, and 332, or the consent of the Department. Note: Formerly part of ITAL 360.

ITAL 362. *Italian Theatre from the Eighteenth Century to the Present.* ★3 (either term, 3-0-0). From Goldoni to Pirandello. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly part of ITAL 360.

ITAL 370. *Introduction to the Renaissance.* ★3 (either term, 3-0-0). Selections from Lorenzo il Magnifico, Bembo, Ariosto, Machiavelli, Castiglione, Michelangelo, Tasso. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly ITAL 365.

ITAL 376. *Nineteenth Century Novel I.* ★3 (either term, 3-0-0). Manzoni's Promessi Sposi. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly part of ITAL 375.

ITAL 377. *Nineteenth Century Novel II.* ★3 (either term, 3-0-0). Nievo, Fogazzaro, Verga. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly part of ITAL 375.

ITAL 378. *Twentieth Century Italian Novel.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department.

ITAL 379. *Topics in Twentieth Century Italian Literature.* ★3 (either term, 3-0-0). Prerequisites: Consent of the Department.

ITAL 380. *Dante's Inferno.* ★3 (either term, 3-0-0). Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly ITAL 480.

ITAL 381. *Dante's Purgatorio and Paradiso.* ★3 (either term, 3-0-0). Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department. Note: Formerly ITAL 481.

ITAL 385. *Short Stories of the Sixteenth Century.* ★3 (either term, 3-0-0). Selection of representative major writers. Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department.

ITAL 390. *Boccaccio's Decameron.* ★3 (either term, 3-0-0). Prerequisites: ITAL 321, 322, 331, and 332, or consent of the Department.

ITAL 395. *Advanced Composition.* ★3 (either term, 3-0-0). Prerequisites: ITAL 200, or 300, or consent of the Department.

ITAL 400. *Renaissance Prose.* ★6 (3-0-0). Machiavelli's *Prince,* Castiglione's *Courtier,* Della Casa's *Galateo,* Cellini's *Autobiography,* Vasari's *Lives,* etc. Prerequisite: Consent of the Department.

ITAL 403. *Fourth-year Honors Language Seminar.* ★2 (0-1s-0).

ITAL 410. *Heroic and Mock-Heroic Epic.* ★6 (3-0-0). Pulci, Boiardo, Ariosto, Tasso. Prerequisite: Consent of the Department.

ITAL 420. *Renaissance Theatre.* ★6 (3-0-0). *La commedia del '500; La Pastorale;* the beginning of *Melodramma.* Prerequisite: Consent of the Department.

ITAL 499. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual students. Prerequisite: Consent of the Department.

44.23.3 HONORS AND GRADUATE COURSES

ITAL 500. *Contemporary Italian Literary Aesthetics.* ★6 (3-0-0). Croce's aesthetics. Marxist criticism — Gramsci and G. della Volpe. Prerequisite: Two senior Italian courses.

ITAL 501. *Bibliography and Thesis Style.* ★1 (either term, 2-0-0). **Note: Formerly ITAL 690.**

ITAL 510. *Literary Movements of the Twentieth Century.* ★6 (3-0-0). A critical reading of the major periodicals of the first-half of the century: *La Ronda, La Voce, La Critica,* etc.

ITAL 570. *Early Humanist Comedy.* ★6 (3-0-0). Vergerio's *Paulus,* Barzizza's *Cauteriaria,* Ranzo's *De falso Hypocrita,* Pisani's *Repetitio Zanini* and *Philogenia,* Piccolomini's *Chrysis.*

ITAL 580. *The Literature of "Trattati d'Arte".* ★6 (3-0-0). Treatises on poetics, rhetoric, and art in the Renaissance and Baroque periods.

ITAL 590. *Goldoni and the Theatre of the Eighteenth Century.* ★6 (3-0-0). Goldoni's plays with reference to contemporary trends: Metastasio, Zeno, Gozzi.

ITAL 599. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of some great author or question not dealt with in other Honors or Graduate courses. Designed to meet the needs of individual Honors or Graduate students. Prerequisite: Consent of the Department.

ITAL 600. *Topics in Thirteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 610. *Topics in Fourteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 620. *Topics in Fifteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 630. *Topics in Sixteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 640. *Topics in Seventeenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 650. *Topics in Eighteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 660. *Topics in Nineteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 670. *Topics in Twentieth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of some great author or question not dealt with in the other Graduate courses. Designed to meet the needs of individual Graduate students.

Note: For additional courses related to Italian, see Romance Linguistics in § 44.34 and Romance Literatures in § 44.35.

44.24 Japanese

Department of History

44.24.1 JUNIOR COURSES

JAPAN 100. *Introductory Modern Standard Japanese.* ★6 (either term, 0-10L-0). This course is designed primarily for students whose first language is not Japanese. It introduces the student to speaking, listening to, and writing Japanese.

JAPAN 201. *Conversational Japanese I.* ★3 (either term, 3-0-2). Elementary level conversational Japanese language. Note: JAPAN 100 and 201 may not both be taken for credit.

JAPAN 202. *Conversational Japanese II.* ★3 (either term, 3-0-2). Elementary level conversational Japanese. Prerequisite: JAPAN 201 or equivalent. Note: JAPAN 100 and 202 may not both be taken for credit.

44.24.2 SENIOR COURSES

JAPAN 300. *Basic Integrated Modern Standard Japanese.* ★6 (either term, 0-10L-0). Emphasis on reading, writing, and oral/aural skills. Prerequisite: JAPAN 100 or equivalent.

JAPAN 301. *Intermediate Japanese Language I.* ★3 (either term, 3-0-2). Emphasis on colloquial Japanese conversation and informal composition. Prerequisite: JAPAN 300 or equivalent.

JAPAN 302. *Intermediate Japanese Language II.* ★3 (either term, 3-0-2). Further emphasis on colloquial Japanese conversation and composition. Prerequisite: JAPAN 301 or equivalent.

JAPAN 303. *Intermediate Japanese Language III.* ★3 (either term, 3-0-4). Selected readings on Japanese culture featuring a variety of calligraphic styles in colloquial and literary Japanese. Prerequisite: JAPAN 300 or equivalent.

JAPAN 304. *Intermediate Japanese Language IV.* ★3 (either term, 3-0-4). Further selected readings in Japanese culture featuring a variety of calligraphic styles in colloquial and literary Japanese. Prerequisite: JAPAN 303 or equivalent.

JAPAN 307. *Japanese Language for Readers of Chinese I.* ★3 (either term, 3-0-2). Integrated course in Japanese conversation and reading for persons who already read Chinese. Prerequisite: Knowledge of written Chinese. Note: Only one of JAPAN 100, 201, or 307 may be taken for credit.

JAPAN 308. *Japanese Language for Readers of Chinese II.* ★3 (either term, 3-0-2). Integrated course in Japanese conversation and reading for persons who already read Chinese. Prerequisite: JAPAN 307 or equivalent. Note: Only one of JAPAN 100, 202, or 308 may be taken for credit.

JAPAN 310. *Introduction to Classical Japanese.* ★3 (either term, 3-0-2). Introduction to classical Japanese grammar through the reading of some of the easier early literary texts. Prerequisite: Consent of the Department.

JAPAN 321. *Early Japanese Literature in Translation.* ★3 (either term, 3-0-0). Selected readings in English of Japanese literature to 1868.

JAPAN 322. *Modern Japanese Literature in Translation.* ★3 (either term, 3-0-0). Selected readings in English of Japanese literature since 1868.

JAPAN 325. *Calligraphy I.* ★3 (either term, 3-0-0). Introduction to the history of the Japanese and Chinese written languages and to basic vocabulary through brush writing and reading. Note: JAPAN 325 and CHINA 325 may not both be taken for credit. This course is designed for students whose first language is not Japanese.

JAPAN 326. *Calligraphy II.* ★3 (either term, 3-0-0). Study of historical changes in style and usage of characters through brush writing and reading. Prerequisite: JAPAN 325, or CHINA 325, or consent of the Department. Note: JAPAN 326 and CHINA 326 may not both be taken for credit. This course is designed for students whose first language is not Japanese.

JAPAN 401. *Advanced Japanese Language I.* ★3 (either term, 3-0-3). Selected readings on Japan. Prerequisite: JAPAN 304 or equivalent.

JAPAN 402. *Advanced Japanese Language II.* ★3 (either term, 3-0-3). Further selected readings on Japan. Prerequisite: JAPAN 401 or equivalent.

JAPAN 403. *Readings from Japanese Journalism.* ★3 (either term, 3-0-3). Advanced reading from Japanese newspapers and magazines. Spoken Japanese required. Prerequisite: JAPAN 402 or consent of the Department.

JAPAN 404. *Readings in Japanese Prose.* ★3 (either term, 3-0-3). Advanced readings from fiction and social commentary. Spoken Japanese required. Prerequisite: JAPAN 403 or equivalent.

JAPAN 405. *Readings in Classical Japanese.* ★3 (either term, 3-0-3). Advanced reading in classical Japanese literary, historical, and philosophical texts. Prerequisite: JAPAN 310 or equivalent.

JAPAN 406. *Readings in Japanese Drama.* ★3 (either term, 3-0-2). Reading and cultural analysis in Japanese of selected works from early and modern eras. Prerequisite: JAPAN 402 or consent of the Department.

JAPAN 407. *Readings in Japanese Poetry.* ★3 (either term, 3-0-2). Reading and analysis in Japanese of selected works from early and modern eras. Prerequisite: JAPAN 402 or consent of the Department.

JAPAN 410. *Kanbun I.* ★3 (either term, 3-0-3). The reading of Chinese as Japanese. Prerequisite: Competence in reading modern Japanese.

JAPAN 411. *Kanbun II.* ★3 (either term, 3-0-3). The reading of Chinese as Japanese. Prerequisite: Competence in reading modern Japanese.

JAPAN 481. *Supervised Reading in Japanese I.* ★3 (either term, 3-0-4). Accelerated reading course primarily for senior and graduate students for special areas of need or interest. Prerequisite: Written consent of the Department.

JAPAN 482. *Supervised Reading in Japanese II.* ★3 (either term, 3-0-4). Further accelerated reading study for senior and graduate students. Prerequisite: Written consent of the Department.

JAPAN 581. *Supervised Study in the Japanese Language I.* ★3 (either term, 3-0-4). Prerequisite: Written consent of the Department.

JAPAN 582. *Supervised Study in the Japanese Language II.* ★3 (either term, 3-0-4). Prerequisite: Written consent of the Department.

44.25 Latin

Department of Classics

NOTE: For additional related courses see § § 44.9 and 44.18.

44.25.1 JUNIOR COURSES

LATIN 100. *Beginners' Latin.* ★6 (4-0-1). Essentials of grammar, syntax, the reading of easy Latin and prose composition. Secondary emphasis on the connexion of English with Latin.

LATIN 200. *Latin Authors.* ★6 (3-0-0). Practice in the readings of Latin and in the writing of simple Latin sentences. Note: For students with matriculation in Latin 30 or with LATIN 100.

44.25.2 SENIOR COURSES

LATIN 300. *Latin Authors and Prose Composition.* ★6 (3-0-1). Sight translation and principles of language. For students proceeding from LATIN 100 or 200.

LATIN 311. *Grammar.* ★3 (either term, 3-0-0). A study of Latin grammar. Prerequisite: LATIN 300 or equivalent. Note: Restricted to Honors students.

LATIN 351. *Ovid.* ★3 (either term, 3-0-0). Prerequisite: LATIN 300 or consent of the Department.

LATIN 361. *Roman Comedy.* ★3 (either term, 3-0-0). Selections from Plautus and Terence.

LATIN 363. *Cicero.* ★3 (either term, 3-0-0). Selections from Cicero's speeches, dialogues, and essays.

LATIN 364. *Sallust.* ★3 (either term, 3-0-0). Selections from Sallust.

LATIN 366. *Tacitus.* ★3 (either term, 3-0-0). Agricola and/or Germania.

LATIN 367. *Vergil.* ★3 (either term, 3-0-0). Selections from the Aeneid.

LATIN 368. *Roman Lyric Poetry.* ★3 (either term, 3-0-0). Selections from Horace and Catullus.

LATIN 369. *Livy.* ★3 (either term, 3-0-0).

LATIN 370. *Roman Satire.* ★3 (either term, 3-0-0). Selections from Horace, Juvenal, and others.

LATIN 411. *Latin Grammar and Style.* ★3 (2-0-0; 1-0-1). The writing of Latin prose. Note: A single-term course offered over the full session.

LATIN 464. *Cicero's Letters.* ★3 (either term, 3-0-0).

LATIN 466. *Lucretius.* ★3 (either term, 3-0-0).

LATIN 467. *Tacitus (later works).* ★3 (either term, 3-0-0).

44.25.3 HONORS AND GRADUATE COURSES

LATIN 511. *Latin Grammar and Style.* ★3 (2-0-0; 1-0-1). Note: A single-term course offered over the full session.

LATIN 530. *History of the Latin Language I.* ★3 (First Term, 3-0-0). Prerequisite: LATIN 411, or 511, or equivalent.

LATIN 531. *History of the Latin Language II.* ★3 (Second Term, 3-0-0). Prerequisite: LATIN 530.

LATIN 532. *Latin Epigraphy.* ★3 (either term, 3-0-0).

LATIN 533. *Medieval Latin.* ★3 (either term, 3-0-0). Note: Formerly LATIN 534.

LATIN 534. *Latin Palaeography.* ★3 (either term, 3-0-0). Note: Formerly LATIN 533.

LATIN 535. *Early Roman Poetry.* ★3 (either term, 3-0-0).

LATIN 536. *Vergil I.* ★3 (First Term, 3-0-0).

LATIN 537. *Vergil II.* ★3 (Second Term, 3-0-0).

LATIN 538. *Lucretius.* ★3 (either term, 3-0-0).

LATIN 539. *Roman Philosophical Authors.* ★3 (either term, 3-0-0).

LATIN 540. *Catullus.* ★3 (either term, 3-0-0).

LATIN 541. *Roman Comedy.* ★3 (either term, 3-0-0).

LATIN 542. *Roman Letters.* ★3 (either term, 3-0-0).

LATIN 543. *Roman Satire.* ★3 (either term, 3-0-0).

LATIN 544. *Lyric Poetry.* ★3 (either term, 3-0-0).

LATIN 545. *Elegiac Poetry.* ★3 (either term, 3-0-0).

LATIN 546. *Tacitus I.* ★3 (First Term, 3-0-0).

LATIN 547. *Tacitus II.* ★3 (Second Term, 3-0-0).

LATIN 548. *Cicero I.* ★3 (First Term, 3-0-0).

LATIN 549. *Cicero II.* ★3 (Second Term, 3-0-0).

LATIN 550. *Silver Latin I.* ★3 (First Term, 3-0-0).
LATIN 551. *Silver Latin II.* ★3 (Second Term, 3-0-0).
LATIN 552. *Studies in Latin Literature I.* ★3 (First Term, 3-0-0).
LATIN 553. *Studies in Latin Literature II.* ★3 (Second Term, 3-0-0).
LATIN 554. *Readings in Roman History I.* ★3 (First Term, 3-0-0).
LATIN 555. *Readings in Roman History II.* ★3 (Second Term, 3-0-0).
LATIN 556. *Roman Historiography I.* ★3 (First Term, 3-0-0).
LATIN 557. *Roman Historiography II.* ★3 (Second Term, 3-0-0).
LATIN 558. *Roman Military Authors.* ★3 (either term, 3-0-0).
LATIN 559. *Roman Antiquarians.* ★3 (either term, 3-0-0).
LATIN 598. *Supervised Reading.* ★3 (either term, 3-0-0).
LATIN 599. *Supervised Reading.* ★3 (either term, 3-0-0).
LATIN 621. *Advanced Latin Palaeography.* ★6 (3-0-0). Prerequisite: LATIN 534.
LATIN 652. *Studies in Latin Literature A.* ★3 (either term, 3-0-0).
LATIN 653. *Studies in Latin Literature B.* ★3 (either term, 3-0-0).
LATIN 698. *Conference Course.* ★3 (either term, 3-0-0).
LATIN 699. *Conference Course.* ★3 (either term, 3-0-0).

44.26 Linguistics

Department of Linguistics
Faculty of Science

44.26.1 JUNIOR COURSES

NOTE: Linguistics courses considered to be Science Courses will be found in the Faculty of Science section of the Calendar (§ 184.17).

LING 201. *Introduction to the Study of Language I.* ★3 (First Term, 3-0-0). Survey of the methodolgy of language scholarship; the cultural-humanistic tradition.
LING 202. *Introduction to the Study of Language II.* ★3 (Second Term, 3-0-0). Survey of the methodology of language scholarship; the scientific tradition. Prerequisite: LING 201.

44.26.2 SENIOR COURSES

LING 305. *Practical Phonetics.* ★3 (First Term, 3-0-3). Recognizing, transcribing, and producing speech sounds, using several systems of phonetic notation; problems in phonetic analysis; techniques for describing the sound system of an unfamiliar language, working with a native informant.
LING 382. *Modern English Syntax.* ★3 (either term, 3-0-0). Transformational description of English syntax. Prerequisite: LING 303 or consent of the Department.
LING 405. *Historical Linguistics I.* ★3 (First Term, 3-0-0). Principles and methods in historical linguistics. Prerequisites: LING 303.
LING 406. *Historical Linguistics II.* ★3 (Second Term, 3-0-0). Studies in historical linguistics. Prerequisite: LING 405.
LING 414. *Field Methods.* ★3 (Second Term, 3-0-3). Elicitation and analysis methods in the field situation. Prerequisite: LING 303.
LING 497. *Topics in Language Analysis I.* ★3 (Second Term, 3-0-0). Problems in the analysis of language; examples from English. Prerequisites: LING 303 and 382.
LING 498. *Topics in Language Analysis II.* ★3 (Second Term, 3-0-0). Problems in the analysis of language; examples from a variety of languages. Prerequisites: LING 303 and 382.

44.26.3 HONORS AND GRADUATE COURSES

LING 509. *History of Linguistics I.* ★3 (First Term, 3-0-0). Topics in the history of linguistic scholarship; Panani to the Renaissance grammarians. Prerequisites: LING 407, 409, and 410.
LING 510. *History of Linguistics II.* ★3 (Second Term, 3-0-0). Topics in the history of linguistic scholarship; the post-Renaissance grammarians to the present. Prerequisites: LING 407, 409, 410, and 509.
LING 515. *Conference Course I.* ★3 (First Term, 3-0-0). Designed to meet the needs of the individual honors student. Prerequisite: Consent of the Department.
LING 516. *Conference Course II.* ★3 (Second Term, 3-0-0). Designed to meet the needs of the individual honors student. Prerequisite: Consent of the Department.

44.27 Music

44.27.1 JUNIOR COURSES

MUSIC 200. *Rudiments of Music.* ★3 (either term, 3-0-0). Fundamentals of music theory approached through aural and written training. Note: Not open to B.Mus. students.
MUSIC 202. *History of Medieval and Renaissance Music.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.
MUSIC 203. *History of Baroque Music.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.
MUSIC 206 *Introduction to Music I.* ★3 (First Term, 3-0-0). Definition of terms; forms and styles in music from Baroque through Classical periods. Listening to recorded examples. Note: Open to all students not eligible for MUSIC 202, 203, 301, 304, or 402.
MUSIC 207. *Introduction to Music II.* ★3 (Second Term, 3-0-0). The Romantic period to the present. Familiarity with the concert repertoire. Note: Open to all students not eligible for MUSIC 202, 203, 301, or 402.
MUSIC 209. *Woodwind Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on clarinet. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not take 209 for credit.
MUSIC 210. *Foundations of Music.* ★6 (0-5L-0). The development of a musical repertoire and knowledge of basic content appropriate for teachers. Note: Limited to students in the Faculty of Education not eligible for admission to MUSIC 301 and 304.
MUSIC 216. *Brass Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on trumpet. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not take 216 for credit.
MUSIC 218. *String Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on violin and viola. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not take 218 for credit.
MUSIC 220. *Percussion Techniques.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on percussion instruments. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not take 220 for credit.
MUSIC 222. *Second Practical Subject.* ★3 (1-0-0). Note: Restricted to B.Mus. students, and B.Ed. students majoring in secondary music education. Note: A single-term course offered over the full session.
MUSIC 223. *First Practical Subject.* ★6 (2-0-3). Note: Required of all candidates in the first year of the B.Mus. program studying orchestral instruments and restricted to these students. Laboratory hours involve participation in large ensemble.
MUSIC 224. *Practical Study.* ★3 (1-0-4). For non-B.Mus. students. Laboratory hours involve participation in large ensemble. Prerequisite: Consent of the Department, based upon audition. Note: a single-term course offered over the full session.
MUSIC 225. *First Practical Subject.* ★6 (2-0-4). Note: Required of all candidates in the first year of the B.Mus. program studying a keyboard instrument, or voice and restricted to these students. Laboratory hours involve participation in large ensemble.
MUSIC 229. *Ensemble.* ★3 (0-2L-0). For non-B.Mus. students. Prerequisite: Consent of the Department, based upon audition. Note: A single-term course offered over the full session.
MUSIC 250. *Elementary Harmony.* ★3 (0-3L-0). Diatonic harmony, including secondary sevenths. Modulation. Use of unessential notes of all kinds. Harmonizing of chorales in the style of Bach. Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement and Aural Skills Examinations for other than B.Mus. students. Note: A single-term course offered over the full session. Formerly a full-session course.
MUSIC 251. *Elementary Aural Skills.* ★3 (0-3L-0). The aural perception of materials covered in MUSIC 250. Prerequisite: MUSIC 200 or satisfactory completion of Dept. of Music

Theory Placement and Aural Skills Examinations for other than B.Mus. students. Note: A single-term course offered over the full session. Formerly part of MUSIC 250.

44.27.2 SENIOR COURSES

Note: The ability to read music is required for all courses listed below.

MUSIC 301. *History of Classical Music.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.

MUSIC 304. *History of Romantic and Post-Romantic Music.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.

MUSIC 305. *Musical Literature for Children.* ★3 (Second Term, 3-0-0). Survey, selection, and use of recorded materials, films, film strips, and books about music and musicians. Prerequisite: ED CI 239 or equivalent.

MUSIC 307. *Instruments for Children.* ★3 (First Term, 3-0-0). Laboratory experience with recorder ensemble, small winds, chording, and percussion instruments. Prerequisite: ED CI 239 or equivalent.

MUSIC 310. *Woodwind Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction on woodwind instruments. Prerequisite: MUSIC 209 or proficiency examination. Note: Students with credit in MUSIC 311 may not offer 310 for credit.

MUSIC 311. *Instrumental Techniques.* ★6 (0-6L-0). Practical and theoretical instruction on the instruments of the band and orchestra. Note: Students with credit in one or more of MUSIC 209, 216, 218, 220, 310, 317, 319 may not offer MUSIC 311 for credit.

MUSIC 312. *Collegium Musicum.* ★3 (0-2L-0). Preparation and performance of vocal and instrumental music from medieval to classical times. Closely associated with the content of MUSIC 202 and 203. Note: A single-term course offered over the full session.

MUSIC 313. *History of Jazz.* ★3 (either term, 3-0-0). An historical survey of the main evolutionary trends in jazz through analysis of distinctive jazz styles and listening to recorded examples. Prerequisite: MUSIC 200 or satisfactory completion of the Department of Music Theory Placement Examination for other than B.Mus. students.

MUSIC 317. *Brass Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction in brass instruments. Prerequisite: MUSIC 216 or proficiency examination. Note: Students with credit in MUSIC 311 may not take 317 for credit.

MUSIC 319. *String Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction on cello and string bass. Prerequisite: MUSIC 218 or proficiency examination. Note: Students with credit in MUSIC 311 may not take 319 for credit.

MUSIC 322. *Second Practical Subject.* ★3 (1-0-0). Note: Restricted to B.Mus. students, and B.Ed. students majoring in secondary music education. Note: A single-term course offered over the full session.

MUSIC 323. *First Practical Subject.* ★6 (2-0-3). Note: Required of all candidates in the second year of the B.Mus. program in Applied Music, Orchestral Instruments, and restricted to these students. Laboratory hours involve participation in large ensemble.

MUSIC 324. *First Practical Subject.* ★3 (1-0-4). Note: Required of all candidates in the second year of the B.Mus. program in Theory, Composition, and Music History and Literature. Open to others by consent of the Department. Laboratory hours involve participation in large ensemble. Prerequisite: MUSIC 223, 224, or 225, or equivalent. Note: A single-term course offered over the full session.

MUSIC 325. *First Practical Subject.* ★6 (2-0-4). Note: Required by candidates in the second year of the B.Mus. programs in Keyboard and Voice and restricted to these students. Laboratory hours involve participation in large ensemble.

MUSIC 326. *Master Class in Applied Music.* ★3 (3-0-0). Prerequisites: MUSIC 223, or 225, or equivalent, and consent of the Department. Note: To be offered only during Spring and/or Summer Sessions.

MUSIC 328. *Piano Accompaniment.* ★3 (0-2L-0). Prerequisites: MUSIC 225 and consent of the Department. Note: A single term course offered over the full session.

MUSIC 329. *Ensemble.* ★3 (0-2L-0). Note: A single-term course offered over the full session. Prerequisite: Consent of Department based on audition for other than B.Mus. students.

MUSIC 330. *Choral Techniques and Interpretation I.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 250, and 251, or equivalent.

MUSIC 331. *Choral Techniques and Interpretation II.* ★3 (Second Term, 3-0-0). Prerequisites: MUSIC 250, and 251, or equivalent.

MUSIC 332. *Hymnology.* ★3 (either term, 3-0-0). History of the hymn and hymn tune; types of hymns and their uses; analysis and interpretation of hymns; evaluation of standard hymnals. Note: Formerly a full-session course.

MUSIC 350. *Harmony.* ★3 (0-3L-0). Chromatic harmony in four parts. Prerequisite: MUSIC 250. Note: A single-term course offered over the full-session. Formerly a full-session course.

MUSIC 351. *Aural Skills.* ★3 (0-3L-0). The aural perception of materials covered in MUSIC 350. Prerequisite: MUSIC 251. Note: A single-term course offered over the full session.

MUSIC 352. *Counterpoint.* ★6 (3-0-0). Free counterpoint in two and three parts. Elementary canonic writing. Setting of simple texts. The writing of two-part inventions. Prerequisites: MUSIC 250 and 251.

MUSIC 360. *Introduction to Composition.* ★6 (3-0-0). Prerequisites: MUSIC 250, and 251, or equivalent.

MUSIC 361. *Form and Analysis.* ★3 (either term, 3-0-0). Study of cadence types and phrase structure. Analysis of traditional forms. Prerequisites: MUSIC 250, and 251, or equivalent. (Note: Formerly MUSIC 261.)

MUSIC 400. *History of Opera.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 401. *History of the Symphony.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 402. *History of Twentieth-Century Music.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.

MUSIC 403. *Piano Pedagogy I.* ★3 (First Term, 2-0-1). Prerequisite: Consent of Department.

MUSIC 404. *Piano Pedagogy II.* ★3 (Second Term, 2-0-1). Prerequisite: MUSIC 403.

MUSIC 406. *Liturgics and Service Improvisation.* ★6 (1-0-2). Prerequisites: MUSIC 324 or 325 (organ) and consent of Department.

MUSIC 407. *History of the Concerto.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 408. *History of Chamber Music.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 409. *Viola Techniques for Violinists.* ★3 (1-0-0). Prerequisite: MUSIC 323, or 324, or equivalent. Note: A single-term course offered over the full session.

MUSIC 410. *Studies in Musical Style I.* ★3 (either term, 3-0-0). Forms, techniques, and styles studied through representative composers and genres of selected style periods. Prerequisites: MUSIC 202, 203, 301, 304, and 402.

MUSIC 411. *Studies in Musical Style II.* ★3 (either term, 3-0-0). Forms, techniques, and styles studied through representative composers and genres of selected style periods. Prerequisites: MUSIC 202, 203, 301, 304, and 402.

MUSIC 415. *Introduction to Conducting.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 250, and 251, or equivalents.

MUSIC 416. *Instrumental Conducting.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 415.

MUSIC 417. *Choral Conducting.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 415.

MUSIC 418. *Choral Literature I.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 250, and 251, and any one of the following: MUSIC 202, 203, 301, 304, 402, or equivalents.

MUSIC 419. *Choral Literature II.* ★3 (Second Term, 3-0-0). Prerequisites: MUSIC 250 and 251 and any one of the following: MUSIC 202, 203, 301, 304, 402 or equivalents.

MUSIC 422. *Second Practical Subject.* ★3 (1-0-0). Note: A single-term course offered over the full session. Restricted to B.Mus. students and B.Ed. students majoring in secondary music education.

MUSIC 423. *First Practical Subject.* ★6 (2-0-3). Note: Required of all candidates in the third year of the B.Mus. program in Applied Music (Orchestral Instruments) and restricted to these students. Laboratory hours include participation in large ensemble.

MUSIC 424. *First Practical Subject.* ★3 (1-0-0). Note: Required of all candidates in the third year of the B.Mus. programs in Theory, Composition, and Music History, and Literature. Open to others by consent of the Department. Prerequisite: MUSIC 324 or equivalent. Note: A single-term course offered over the full session.

MUSIC 425. *First Practical Subject.* ★6 (2-0-0). Note: Required by candidates in the third year of the B.Mus. program in keyboard or voice, and restricted to these students.

MUSIC 426. *Piano Improvisation.* ★3 (either term, 0-3L-0). Prerequisites: MUSIC 350, 351, and consent of the instructor.

MUSIC 427. *Continuo Realization.* ★3 (either term, 0-3L-0). Prerequisites: MUSIC 350, 351 and consent of the instructor.

MUSIC 428. *Art Song Interpretation.* ★3 (0-2L-0). Open to singers and pianists in the third and fourth years of the B. Mus. program. Prerequisite: MUSIC 324, or 325, or equivalent, and consent of the Department. Note: A single-term course offered over the full session.

MUSIC 429. *Ensemble.* ★3 (0-2L-0). Prerequisite: Consent of Department based on audition for other than B.Mus. students. Note: A single-term course offered over the full session.

MUSIC 430. *Vocal Coaching.* ★3 (0-3L-0). Coaching of vocal repertoire for individuals and ensembles. Prerequisite: Consent of Department based on audition for other than B.Mus. Students. Note: A single-term course offered over the full-session.

MUSIC 431. *Band Techniques.* ★3 (either term, 0-3L-0). Musical and practical aspects of band conducting. Prerequisite: A conducting course or substantial conducting experience.

MUSIC 432. *Music of the Great Liturgies.* ★6 (3-0-0). Comparison of the Jewish, Eastern Orthodox, Catholic, Lutheran, and Protestant Episcopal liturgies and their music; relation to music in the non-liturgical service; the church year.

MUSIC 435. *Vocal Literature I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of Department for other than B.Mus. students.

MUSIC 436. *Vocal Literature II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department for other than B.Mus. students.

MUSIC 437. *Sixteenth-Century Counterpoint.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 202 and 350. Note: Formerly part of MUSIC 433.

MUSIC 438. *Introduction to Medieval and Renaissance Music Theory.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 437. Note: Formerly part of MUSIC 433.

MUSIC 452. *Counterpoint.* ★6 (3-0-0). Continuation of three-voiced counterpoint, vocal,and instrumental styles. Introduction to four-voiced counterpoint. Prerequisite: MUSIC 352.

MUSIC 455. *Opera Workshop I.* ★3 (First Term, 3-0-5). Prerequisite: MUSIC 324 or 325 or equivalent.

MUSIC 456. *Opera Workshop II.* ★3 (Second Term, 3-0-5). Prerequisite: MUSIC 455 or consent of the Department.

MUSIC 457. *String Literature I.* ★3 (First Term, 3-0-0). Prerequisite: One of MUSIC 203, 301, or 304, or equivalent.

MUSIC 458. *String Pedagogy I.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 323, or 324, or equivalent.

MUSIC 460. *Composition.* ★6 (3-0-0). A sequent course to MUSIC 360 with emphasis on the study of, and writing in larger forms. Note: Public performance of works completed in the course will be expected.

MUSIC 462. *Fundamentals of Orchestration and Arranging.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 350/351 or equivalent.

MUSIC 463. *Orchestration.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 462.

MUSIC 465. *First Practical Subject.* ★6 (2-0-1). Prerequisite: MUSIC 325. Note: Required by candidates concentrating in Piano Pedagogy in the third year of the B.Mus. program and restricted to these students.

MUSIC 501. *Music History Seminar I.* ★3 (First Term, 0-3s-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 502. *Music History Seminar II.* ★3 (Second Term, 0-3s-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 503. *Piano Literature I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 504. *Piano Literature II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 505. *Bibliography and Methods of Research I.* ★3 (First Term, 3-0-0).

MUSIC 506. *Tutorial Study.* ★3 (either term, 3-0-0). Independent research in a specific area of the student's interest. Prerequisites: MUSIC 202, 203, 301, 304, and 402.

MUSIC 507. *Bibliography and Methods of Research II.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 505.

MUSIC 508. *Seminar in Canadian Music.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 402.

MUSIC 510. *Notation of Medieval Music.* ★3 (First Term, 0-3L-0). Development of notation through the various schools of neume notation. Gregorian notation, Troubadour, early polyphonic, model notation, the Franconian system, and the period of Ars Nova. The transcription of facsimiles. Prerequisite: MUSIC 202.

MUSIC 520. *Notation of Renaissance Music.* ★3 (Second Term, 0-3L-0). Tablature and keyboard notation, proportional notation, white notation of the Fifteenth and Sixteenth Centuries. The transcription of facsimiles. Prerequisite: MUSIC 202.

MUSIC 522. *Second Practical Subject.* ★3 (1-0-0). Note: A single-term course offered over the full session. Restricted to B.Mus. students and B.Ed. students majoring in secondary music education.

MUSIC 523. *First Practical Subject.* ★6 (2-0-3). Note: Required of all candidates in the fourth year of the B.Mus. program in Applied Music (Orchestral Instruments) and restricted to these students. Laboratory hours involve participation in large ensemble.

MUSIC 525. *First Practical Subject.* ★6 (2-0-0). Note: Required of students in the fourth year of the B.Mus. program in keyboard or voice and restricted to them.

MUSIC 528. *Art Song Interpretation.* ★3 (0-2L-0). Open to singers and pianists in the third and fourth year of the B.Mus. program. Prerequisite: MUSIC 424, or 425, or 465, and 428, or equivalent, and consent of the Department. Note: A single-term course offered over the full session.

MUSIC 529. *Ensemble.* ★3 (0-2L-0). Prerequisite: Consent of the Department based on audition for other than B.Mus. students. Note: A single-term course offered over the full session.

MUSIC 530. *Vocal Coaching.* ★3 (0-3L-0). Prerequisite: Consent of the Department based on audition for other than B.Mus. students. Note: A single-term course offered over the full session.

MUSIC 531. *History of Organ Building and Design.* ★3 (either term, 3-0-0). Prerequisites: Any two of MUSIC 202, 203, 301, 304, 402, or equivalent.

MUSIC 532. *Music in the Church.* ★3 (either term, 3-0-0). A stylistic and historical study of religious service music. Prerequisite: MUSIC 202, 203, 301, 304, and 402, or equivalent.

MUSIC 533. *Organ and Harpsichord Literature to c. 1750.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 202, and 203, or equivalent.

MUSIC 534. *Organ Literature, c. 1750-present.* ★3 (Second Term, 3-0-0). Prerequisites: Any two of MUSIC 202, 203, 301, 304, 402, or equivalent.

MUSIC 535. *Vocal Pedagogy I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department for other than B.Mus. students.

MUSIC 536. *Vocal Pedagogy II.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 535.

MUSIC 543. *Pedagogy of Theory.* ★6 (3-0-0). Prerequisites: MUSIC 350, 351, and 352, or equivalent.

MUSIC 544. *Advanced Harmony.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 350.

MUSIC 545. *Eighteenth Century Fugue.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 352.

MUSIC 555. *Opera Workshop III.* ★3 (First Term, 3-0-5). Prerequisite: MUSIC 456 or consent of the Department.

MUSIC 556. *Opera Workshop IV.* ★3 (Second Term, 3-0-5). Prerequisite: MUSIC 555 or consent of the Department.

MUSIC 557. *String Literature II.* ★3 (First Term, 3-0-0). Prerequisite: One of MUSIC 203, 301, or 304, or equivalent.

MUSIC 558. *String Pedagogy II.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 323, or 324, or equivalent.

MUSIC 560. *Composition.* ★6 (3-0-0). A sequent course to MUSIC 460 with emphasis on the study of, and writing for, larger groups of voices and instruments. Note: Public performance of works completed in the course will be expected.

MUSIC 561. *Orchestration.* ★6 (3-0-0). Ranges, tonal qualities, technical peculiarities relating to percussion instruments, and the less common wind instruments of the orchestra. Scoring for small groups and for symphony orchestra. Prerequisite: MUSIC 463.

MUSIC 565. *First Practical Subject.* ★6 (2-0-1). Prerequisite: MUSIC 465. Note: Required by candidates concentrating in Piano Pedagogy in the fourth year of the B.Mus. program and restricted to these students.

MUSIC 570. *Aural Theory.* ★3 (0-2L-0). Prerequisite: MUSIC 351 or equivalent. Note: A single-term course offered over the full session.

MUSIC 571. *Score Reading and Orchestral Literature.* ★3 (0-2L-0). Prerequisites: MUSIC 350, 351, and 425, or equivalent. Note: A single-term course offered over the full session.

MUSIC 580. *Twentieth-Century Compositional Techniques.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 350 or consent of the Department.

MUSIC 581. *Trends in Avant Garde Music.* ★3 (Second Term, 3-0-0). Includes studies in electronic music. Prerequisite: MUSIC 580 or consent of the Department.

MUSIC 590. *Music Criticism I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 591. *Music Criticism II.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 590 or equivalent.

MUSIC 605. *Seminar in American Music.* ★3 (either term, 0-3s-0).

MUSIC 606. *Seminar in Baroque Music.* ★3 (either term, 0-3s-0).

MUSIC 607. *Seminar in Classical Music.* ★3 (either term, 0-3s-0).

MUSIC 608. *Seminar in Twentieth-Century Music.* ★3 (either term, 0-3s-0).

MUSIC 612. *Collegium Musicum.* ★3 (0-2L-0).

MUSIC 615. *Seminar in Music History and Literature I.* ★3 (First Term, 0-3s-0).

MUSIC 616. *Seminar in Music History and Literature II.* ★3 (Second Term, 0-3s-0). Prerequisite: MUSIC 615.

MUSIC 623. *First Practical Subject. Orchestral Instruments.* ★6 (2-0-3).

MUSIC 625. *First Practical Subject. Keyboard or Voice.* ★6 (2-0-0).

MUSIC 628. *Art Song Interpretation.* ★3 (0-2L-0). Note: A single-term course offered over the full session. Prerequisite: MUSIC 525, and 528, or equivalent, and consent of the Department.

MUSIC 629. *Ensemble.* ★3 (0-2L-0). A single-term course offered over the full session. Prerequisite: MUSIC 525, or 565, and 528, or equivalent, and consent of the Department.

MUSIC 650. *Analysis of Twentieth Century Music.* ★6 (3-0-0).

MUSIC 655. *Dramatic Coaching in Opera.* ★3 (0-3L-0). Note: A single-term course offered over the full session.

MUSIC 660. *Composition.* ★6 (3-0-0).

MUSIC 673. *Special Projects in String Performance.* ★6 (2-0-3). Note: Restricted to Doctor of Music students.

MUSIC 675. *Special Projects in Keyboard Music.* ★6 (2-0-0). Note: Restricted to Doctor of Music students.

MUSIC 679. *Special Projects in Chamber Music.* ★3 (0-2L-0). Note: A single-term course offered over the full session. Restricted to Doctor of Music students.

MUSIC 683. *Seminar in Keyboard Literature I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 684. *Seminar in Keyboard Literature II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 687. *Seminar in Literature of Stringed Instruments I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 688. *Seminar in Literature of Stringed Instruments II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 690. *Composition in Traditional Styles.* ★3 (either term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 691. *Composition in Contemporary Styles.* ★3 (either term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 692. *Seminar in Musical Analysis I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 693. *Seminar in Musical Analysis II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

44.28 *Old and New Testament Literature*

St. Stephen's College

O NTL 352. *Old Testament Literature.* ★3 (First Term, 3-0-0). Background, authorship, sources, literary qualities and general teaching of the various books of the Old Testament, and the formation of the Old Testament. Note: Formerly part of O NTL 351.

O NTL 353. *New Testament Literature.* ★3 (Second Term, 3-0-0). Jewish and Greek environment of the New Testament; the authorship and content of its various books, and the process of New Testament formation. Note: Formerly part of O NTL 351.

44.29 *Philosophy*

For courses offered by St. Joseph's College, see § 44.29.4.

44.29.1 JUNIOR COURSES

PHIL 221. *Practical Logic.* ★3 (either term, 3-0-0). Elementary methods and principles for distinguishing correct from incorrect reasoning. Topics may include informal fallacies, introduction to scientific method, elementary formal logic, rational decision procedures, and analysis of arguments.

PHIL 230. *Problems of Philosophy.* ★3 (either term, 3-0-0). Some of the central issues of philosophy. Topics such as freedom and determinism, the concept of a person, mind and body, the existence of God, the nature of goodness, justice and value, the nature of knowledge, belief and truth, the problems of scepticism and knowledge in regard to ourselves, other persons, and the external world.

PHIL 239. *Philosophical Analysis of Contemporary Issues.* ★3 (Second Term, 3-0-0). Philosophical analysis of contemporary problems of social concern. Topics such as minority and majority rights, cultural preservation, war and violence, censorship, medical ethics, abortion, sexual equality, our place in the natural environment.

PHIL 240. *Introduction to Western Philosophy.* ★6 (3-0-0). An introduction to the main problems and theories that have dominated philosophical thought in the Western world, through study and discussion of selected philosophical classics. Emphasis upon both a sound acquaintance with the main outlines of our philosophical tradition and the ability to handle philosophical ideas independently.

PHIL 250. *Introduction to Logic.* ★6 (3-0-0). The concepts and techniques of modern logic, with emphasis on sentential and predicate logic. Other topics include critiques of non-deductive techniques, non-formal elements in arguments, traditional analysis of arguments, and philosophical logic. Note: Philosophy 250 presupposes little familiarity with symbolic notation and techniques. Students who already have such familiarity from their work in other disciplines should take Philosophy 390/391 instead.

44.29.2 SENIOR COURSES

Note: Normally each course at the 300-level will be offered every year. Except where noted, there are no formal prerequisites for 300-level courses; however, students will find it valuable to have taken a previous philosophy course such as 230, 239, or 240.

PHIL 320. *Introduction to Indian and Chinese Philosophy.* ★3 (3-0-0). A survey of the main currents in eastern philosophic thought throughout history. Emphasis on philosophy originating in India, and concerning the nature of man, the n-

ture of the universe and the methods of and standards involved in man's knowledge of the world and himself.

PHIL 321. *Metaphysics.* ★3 (either term, 3-0-0). Basic questions concerning the nature of reality. Topics such as existence, materialism and idealism, freedom and determinism, appearance and reality, causality, identity, time and space, universals and particulars.

PHIL 322. *Epistemology.* ★3 (either term, 3-0-0). Questions about knowledge, with special attention given to the sources and justification of knowledge. Topics such as scepticism and certainty, truth, belief and justification, the external world, perception, thought and memory, *a priori* and empirical knowledge.

PHIL 323. *Philosophy of Mind.* ★3 (either term, 3-0-0). Approaches to the question of what it means to be a person and have a mind. The relationship of philosophical ideas to scientific investigations of mental phenomena will be studied. Specific topics include: the mind-body relationship, personal identity, memory, imagination, intention, desire, emotion and sensation.

PHIL 324. *Philosophy of Language.* ★3 (either term, 3-0-0). Contemporary views on the nature of language considering topics such as the learning of language, the relationship between language and the world, the process of communication, and the nature of meaning and of truth.

PHIL 326. *Recent Continental Philosophy I.* ★3 (either term, 3-0-0). One or more recent movements in continental philosophy. Philosophers such as Husserl, Heidegger, Sartre, and Merleau-Ponty, and movements such as existentialism, phenomenology, hermeneutics, structuralism, and Marxism.

PHIL 327. *Recent Continental Philosophy II.* ★3 (Second Term, 3-0-0). A more detailed study of movements introduced in PHIL 326 and/or an introduction to aspects of recent continental philosophy not covered in PHIL 326. Prerequisite: PHIL 326 or consent of Department.

PHIL 328. *Early Twentieth Century Analytic Philosophy.* ★3 (either term, 3-0-0). British and North American movements such as logical atomism and logical positivism, and philosophers such as Moore, Russell, Wittgenstein.

PHIL 329. *Recent Analytic Philosophy.* ★3 (either term, 3-0-0). British and North American philosophical movements: the later work of Wittgenstein; "ordinary language" philosophy; more recent philosophical developments.

PHIL 333. *Political Philosophy I.* ★3 (First Term, 3-0-0). Concentration on central figures in the history of political philosophy such as Aristotle, Hobbes, and Rousseau. Topics include the nature and justification of political obligation, freedom and authority, and the social contract. Note: Formerly part of PHIL 348.

PHIL 334. *Political Philosophy II.* ★3 (Second Term, 3-0-0). An examination of political philosophy from Rousseau's *Social Contract* to the present day. Other authors studied may include Mill, Hegel, Marx, and some contemporary theorists. Prerequisite: PHIL 333 or the consent of the Department. Note: Formerly part of PHIL 348.

PHIL 339. *Ethics I.* ★3 (First Term, 3-0-0). An examination of questions of right and wrong, good and evil, and reasons for action, through study of the ethical theories of authors such as Plato, Aristotle, Hobbes, Hume, and Kant. Some attention will be given to practical moral issues of contemporary interest. Note: Formerly part of PHIL 354.

PHIL 340. *Ethics II.* ★3 (Seconed Term, 3-0-0). J. S. Mill and utilitarianism, and recent criticisms of utilitarian ethics; the development of ethical relativism and scepticism; theories of freedom, moral responsibility, and punishment. Prerequisite: PHIL 339 or the consent of the Department. Note: Formerly part of PHIL 354.

PHIL 341. *Greek Philosophy.* ★3 (First Term, 3-0-0). The thought of the ancient Greek world. Emphasis on Plato and Aristotle; other Greek philosophers may be considered. Prerequisite: PHIL 230, or 240, or any 300-level course, or consent of the Department.

PHIL 343. *Medieval Philosophy.* ★3 (Second Term, 3-0-0). The major themes and thinkers of the medieval world. Prerequisite: PHIL 341, or consent of the Department.

PHIL 345. *Philosophy from Descartes to Kant.* ★3 (First Term, 3-0-0). The major movements from the beginnings of modern philosophy up to and including Kant; philosophers such as Descartes, Leibniz, Spinoza, Locke, Berkeley and Hume.

PHIL 347. *Philosophy from Kant to Russell.* ★3 (Second Term, 3-0-0). The major movements from Kant to the beginning of the twentieth century; in addition to Kant, philosophers such as Schopenhauer, Hegel, Kierkegaard, Marx, Nietzsche, Mill, and Russell. Prerequisite: PHIL 345 or consent of the Department.

PHIL 349. *Aesthetics: Philosophy of Art.* ★3 (either term, 3-0-0). An introduction to some of the traditional theories, for example, the expressionist and the formalist theories, which investigate the nature and function of the arts. The nature of aesthetic experience will also be considered.

PHIL 350. *Aesthetics: Philosophy of Criticism.* ★3 (either term, 3-0-0). An introduction to the philosophical foundations of art criticism. Questions concerning the standards of interpretation and of evaluation of the arts will be given special attention.

PHIL 351. *Aesthetics: The Arts and Society.* ★3 (either term, 3-0-0). An introduction to the philosophical questions and problems relating to the place and importance of art and the artists in society. Issues such as censorship of the arts and the political role of the arts will be considered.

PHIL 352. *Social Philosophy.* ★3 (either term, 3-0-0). A philosophical and synoptic study of the nature of society.

PHIL 353. *Philosophy of History.* ★3 (either term, 3-0-0). An introduction to various philosophical conceptions of history, including a critical examination of the assumptions and consequences of each interpretation.

PHIL 355. *Philosophy of the Environment.* ★3 (either term, 3-0-0). Designed to bring traditional and contemporary philosophical theories and methods to bear on issues raised by man's relationship to his environment. Certain major environmental problems, such as pollution, overpopulation, or resource exhaustion will be considered in regard to their ethical, aesthetic, or metaphysical ramifications.

PHIL 357. *Philosophy of Religion I.* ★3 (either term, 3-0-0). General topics in the Philosophy of Religion; selections from the following will be studied: The concept of 'religion', the relations between Philosophy and Religion, arguments for and against the existence of God, meaning and intelligibility in religious language, religion and morality, religion and 'the meaning of life', implications of the study of religion in the Social Sciences.

PHIL 358. *Philosophy of Religion II.* ★3 (Second Term, 3-0-0). A scrutiny of more particular concepts and problems in religion; such as 'God' (in particular religions), 'Incarnation', 'Miracle', 'Prayer','Life after Death', 'Religious Experience', 'Transcendence', 'Problem of Evil'. Prerequisite: PHIL 357 or consent of the Department.

PHIL 361. *Inductive Logic.* ★3 (either term, 3-0-0). An introduction to the procedures of inductive logic, together with an examination of its problems and limitations.

PHIL 364. *Introduction to Philosophy of Science I.* ★3 (either term, 3-0-0). This course is designed to survey the foundations of scientific knowledge, by explaining the methods and basic assumptions which have evolved in science over the centuries.

PHIL 365. *Philosophy of the Social Sciences.* ★3 (either term, 3-0-0). A critical examination of the theories of man and of society which underlie the various sciences of man; and an evaluation of the methods appropriate to such disciplines. Consideration will be given to movements such as positivism, ethnomethodology and critical theory, and to figures such as Habermas, Popper, and Winch.

PHIL 366. *Introduction to Philosophy of Science II.* ★3 (Second Term, 3-0-0). Topics that may be discussed include the nature of scientific theories and the nature of causation, laws and explanation. Note: Formerly part of PHIL 364, a full-session course. Prerequisite: PHIL 364 or consent of the Department.

PHIL 367. *Philosophical Methodology.* ★3 (either term, 3-0-0). A consideration of the various techniques employed by philosophers in working out philosophical problems. Both traditional and contemporary methods, such as those of rationalism, empiricism, idealism, pragmatism, and language analysis will be considered.

PHIL 370. *Philosophy and Literature.* ★6 (3-0-0). An examination of literature as a means of expression of philosophic concepts. This will involve a consideration of literature as philosophy — including an examination of literary expression as a type of philosophic methodology. Problems of philosophy, such as the notion of time, the question of personal

identity,the problem of intersubjectivity, types of aesthetic criteria, theories of ethical motivation, free will vs. determinism, etc., will be investigated in both literary and philosophic sources. Note: Not open to students with credit in PHIL 371.

PHIL 371. *Philosophy and Literature.* ★3 (either term, 3-0-0). An examination of literature as a means of expression of philosophic concepts. Note: Not open to students with credit in PHIL 370.

PHIL 383. *Philosophy of Law I.* ★3 (either term, 3-0-0). A philosophical study of the foundations of law; positivism, realism, natural law; legal rules and principles, legal rights, legal reasoning. Prerequisite: PHIL 240, or 230 and 239, or consent of the Department.

PHIL 384. *Philosophy of Law II.* ★3 (either term, 3-0-0). Philosophical analysis of legal dimensions of such concepts as justice, responsibility, liberty, punishment. Prerequisite: PHIL 240, or 230 and 239, or consent of the Department.

PHIL 385. *Ethical Theory and Business.* ★3 (either term, 3-0-0). A philosophical approach to questions of business ethics. Topics covered include economic justice; social and environmental responsibility of corporations; conflict of interest; conflicts between rights and profits.

PHIL 386. *Philosophy and Medicine.* ★3 (either term, 3-0-0). A philosophical examination of concepts and issues central to medical knowledge and practice. Emphasis on topics such as: rights and responsibilities of patients and medical personnel, passive and active euthanasia, abortion, medical research and experimentation, disclosure of diagnosis and risks, death and suffering.

PHIL 390. *Symbolic Logic I.* ★3 (First Term, 3-0-0). The concepts, techniques and applications of modern symbolic logic. Topics include syntax, semantics, natural deduction systems, axiomatic systems, independence, consistency, completeness. Emphasis is on the sentential calculus. Prerequisite: Experience in the operation of symbolic notation outside of logic, or some previous work in logic.

PHIL 391. *Symbolic Logic II.* ★3 (Second Term, 3-0-0). Topics as in Philosophy 390, but with emphasis on the predicate calculus with identity. Prerequisite: PHIL 390 or consent of the Department.

PHIL 410. *Philosophy of Language.* ★3 (either term, 3-0-0). Selected problems concerning the nature of language and meaning. Prerequisite: PHIL 324 or consent of the Department.

PHIL 412. *Analytic Philosophy.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

PHIL 414. *Topics in Philosophy of Science I.* ★3 (either term, 3-0-0). Prerequisite: PHIL 364 or consent of the Department.

PHIL 415. *Topics in Philosophy of Science II.* ★3 (either term, 3-0-0). Prerequisite: PHIL 364 or consent of the Department.

PHIL 416. *Wittgenstein.* ★3 (either term, 3-0-0). Prerequisite: PHIL 324, or 328, or 329, or consent of the Department.

PHIL 418. *Problems in Philosophy.* ★6 (3-0-0).

PHIL 422. *Honors Tutorial I.* ★3 (First Term, 3-0-0). Prerequisite: Open only to final year Honors students.

PHIL 423. *Honors Tutorial II.* ★3 (Second Term, 3-0-0). Prerequisite: Open only to final year Honors students.

PHIL 433. *Philosophy of Mathematics.* ★3 (either term, 3-0-0). Topics such as the nature of numbers, mathematical truth, proof and evidence, approaches to the foundations of mathematics, including Hilbert's program, intuitionism, and the logicist reduction of mathematics to logic.

PHIL 434. *Topics in the History of Logic.* ★3 (either term, 3-0-0). Prerequisite: PHIL 250 or 390 or consent of the Department.

PHIL 435. *Modal Logic.* ★3 (either term, 3-0-0). Standard modal systems in sentential and predicate logic including possible world semantics and completeness proofs. Tense logic and epistemic logic may be considered. Prerequisite: PHIL 250, or 390, or consent of the Department.

PHIL 437. *Many-Valued Logic.* ★3 (either term, 3-0-0). A formal presentation of many-valued logic with both infinitely and finitely many values, and their relation to non-standard sentential operators. Prerequisite: PHIL 250, or 390, or consent of the Department.

PHIL 438. *Philosophy of Space and Time I.* ★3 (either term, 3-0-0). Selected theories and problems concerning the nature of space and time with emphasis on time. Some background in philosophy, mathematics or physical sciences is desirable.

PHIL 439. *Philosophy of Space and Time II.* ★3 (either term, 3-0-0). Selected theories and problems concerning the nature of space and time, with emphasis on space. Some background in philosophy, mathematics or physical sciences is desirable.

PHIL 440. *Philosophical Foundations of Probability and Induction.* ★3 (either term, 3-0-0). Certain philosophical problems which lie at the heart of much of philosophy and science: causation, probability and inductive reasoning. Prerequisite: PHIL 250, or 361, or 390, or consent of the Department. Taking or auditing PHIL 361 is recommended.

PHIL 441. *Hume and Kant.* ★3 (either term, 3-0-0). Their contrasting positions on some central questions in epistemology, ethics, and metaphysics. Prerequisite: PHIL 345 or consent of the Department.

PHIL 442. *Nineteenth-Century Philosophy.* ★6 (3-0-0). Main philosophical movements in the nineteenth century; the post-Hegelian reaction against metaphysical idealism in Germany; British idealism, and American pragmatism. Philosophers discussed include Schopenhauer, Nietzsche, Bradley, and Peirce. Prerequisite: PHIL 347 or consent of the Department. Note: Not open to students with credit in PHIL 444.

PHIL 443. *Pragmatism.* ★3 (either term, 3-0-0). The pragmatist approach to philosophical questions, including philosophers such as James, Peirce, Mead, and Dewey. Prerequisite: PHIL 347, or 367, or consent of the Department.

PHIL 444. *Nineteenth-Century Philosophy.* ★3 (either term, 3-0-0). Main philosophical movements in the nineteenth century. Prerequisite: PHIL 347 or consent of the Department. Note: Not open to students with credit in PHIL 442.

PHIL 445. *Rationalism.* ★3 (either term, 3-0-0). An examination of the rationalist tradition in Western philosophy, with emphasis on Descartes, Spinoza, and Leibniz. Prerequisite: PHIL 345 or consent of the Department.

PHIL 447. *Phenomenology.* ★3 (either term, 3-0-0). An examination of the problems which led to the development of the phenomenological method, and a consideration of the method itself. Prerequisite: PHIL 326 or consent of the Department.

PHIL 448. *Philosophy of Logic.* ★3 (either term, 3-0-0). Philosophical problems arising from logic and its application to linguistic analysis. Topics may include truth, qualification, logical form and the analytic-synthetic distinction; philosophers will include Frege, Quine, and Russell. Prerequisite: PHIL 250, or 390, or consent of the Department.

PHIL 449. *Topics in Logic.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

PHIL 450. *Advanced Aesthetics.* ★3 (either term, 3-0-0). Topics concerning art, art criticism, and natural beauty. Prerequisite: PHIL 349, or 350, or 351, or consent of the Department.

PHIL 453. *Topics in Ancient Philosophy.* ★3 (either term, 3-0-0). Prerequisite: PHIL 341 or consent of the Department.

PHIL 454. *Advanced Ethics I.* ★3 (either term, 3-0-0). Central questions in ethical theory, such as the objectivity of moral beliefs and the nature of moral arguments; writings from the history of ethics or from recent authors. Prerequisite: PHIL 348, or 354, or consent of the Department.

PHIL 455. *Advanced Ethics II.* ★3 (either term, 3-0-0). A consideration of special problems in moral philosophy. Prerequisite: PHIL 348, or 354, or consent of the Department.

PHIL 456. *Advanced Social and Political Philosophy I.* ★3 (either term, 3-0-0). Basic concepts used in social and political discourse; methods and techniques of social and political science. Prerequisite: PHIL 348, or 352, or 354, or consent of the Department.

PHIL 457. *Philosophy of Religion.* ★3 (either term, 3-0-0). Central concepts of religion; God, prayer, salvation and religious symbolism; emphasis on the Western tradition, but some themes in Eastern religious thought may be considered. Prerequisite: PHIL 357 or consent of the Department.

PHIL 458. *Advanced Social and Political Philosophy II.* ★3 (either term, 3-0-0). Prerequisite: PHIL 348, or 352, or 354, or consent of the Department.

PHIL 459. *Plato.* ★3 (either term, 3-0-0). Prerequisite: PHIL 341 or consent of the Department.

PHIL 460. *Axiomatic Set Theory.* ★6 (3-0-0). An axiomatic development of Zermelo-Fraenkel set theory. Topics include basic set algebra, functions, orderings, mathematical induction and recursive definitions, the axiom of choice and Zorn's lemma, ordinal and cardinal arithmetic and, time permitting, models for set theory. Prerequisite: Consent of the Department. Note: Not open to students with credit in PHIL 462.

PHIL 461. *Aristotle.* ★3 (either term, 3-0-0). Prerequisite: PHIL 341 or consent of the Department.

PHIL 462. *Axiomatic Set Theory.* ★3 (either term, 3-0-0). An axiomatic development of Zermelo-Fraenkel (or other standard) set theory. Prerequisite: Consent of the Department. Note: Not open to students with credit in PHIL 460.

PHIL 463. *Theory of Action.* ★3 (either term, 3-0-0). An examination of causes, motives, and explanation in the description of human behaviour. Prerequisite: PHIL 323 or consent of the Department.

PHIL 464. *Topics in Existentialism I.* ★3 (either term, 3-0-0). Prerequisite: PHIL 326 or consent of the Department.

PHIL 465. *Theory of Knowledge.* ★3 (either term, 3-0-0). Recent conceptions of knowledge, and related questions concerning perception, memory, justification, and truth. Prerequisite: PHIL 322 or consent of the Department.

PHIL 466. *Topics in Existentialism II.* ★3 (either term, 3-0-0). Prerequisite: PHIL 326 or consent of the Department.

PHIL 467. *Empiricism.* ★3 (either term, 3-0-0). The empiricist approach to certain problems from epistemology, metaphysics, philosophy of science, ethics; philosophers from the Classical British empiricists and the twentieth century. Prerequisite: PHIL 322, or 345, or consent of the Department.

PHIL 468. *Philosophy of Mind.* ★3 (either term, 3-0-0). Topics include the problems characterizing mental phenomena, the relation of minds and bodies; knowledge of other minds, issues in the explanation of behavior, the relevance of cybernetics to the discussion of mental phenomena. Prerequisite: PHIL 323 or consent of the Department.

PHIL 469. *Topics in Metaphysics I.* ★3 (either term, 3-0-0). Prerequisite: PHIL321 or consent of the Department.

PHIL 470. *Philosophy and Literature.* ★3 (either term, 3-0-0). Prerequisite: PHIL 370 or consent of the Department.

PHIL 471. *Directed Reading I.* ★3 (either term, 3-0-0). Prerequisite: Open only to Honors and B.A. (Special) students.

PHIL 473. *Directed Reading II.* ★3 (either term, 3-0-0). Prerequisite: Open only to Honors and B.A. (Special) students.

PHIL 475. *Topics in Theory of Knowledge.* ★3 (either term, 3-0-0). Prerequisite: PHIL 322 or consent of the Department.

PHIL 478. *Topics in Philosophy of Mind.* ★3 (either term, 3-0-0). Prerequisite: PHIL 468. Note: Formerly part of PHIL 468.

PHIL 479. *Topics in Metaphysics II.* ★3 (either term, 3-0-0). Prerequisite: PHIL 321 or consent of the Department.

PHIL 481. *Topics in the History of Modern Philosophy.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

PHIL 483. *Topics in Philosophy of Law.* ★3 (either term, 3-0-0). Prerequisite: PHIL 383 or consent of the Department.

PHIL 490. *Advanced Symbolic Logic.* ★3 (either term, 3-0-0). Development of formal number theory as a first order theory. Godel's proof of incompleteness. Further topics to be determined by interests of the students. Prerequisite: PHIL 391 or consent of the Department.

44.29.3 HONORS AND GRADUATE COURSES

PHIL 496. *Seminar for Honors Philosophy Students in Third Year I.* ★3 (First Term, 0-3s-0).

PHIL 497. *Seminar for Honors Philosophy Students in Third Year II.* ★3 (Second Term, 0-3s-0).

PHIL 500. *Topics in Ancient and Medieval Philosophy I.* ★3 (First Term, 3-0-0).

INT D 500. *Nature of Man.* ★6 (3-0-0). (See § 44.22.)

PHIL 501. *Topics in Ancient and Medieval Philosophy II.* ★3 (Second Term, 3-0-0).

PHIL 502. *Plato.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 503. *Topics in Greek Philosophy I.* ★3 (either term, 3-0-0).

PHIL 504. *Aristotle.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 505. *Topics in Greek Philosophy II.* ★3 (either term, 3-0-0).

PHIL 506. *Topics in Medieval Philosophy I.* ★3 (either term, 3-0-0).

PHIL 507. *Topics in Medieval Philosophy II.* ★3 (either term, 3-0-0).

PHIL 508. *Descartes.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 509. *Locke.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 510. *Hegel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 511. *Topics in the History of Modern Philosophy I.* ★3 (either term, 3-0-0).

PHIL 512. *Marx and Marxism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 515. *Topics in the History of Modern Philosophy II.* ★3 (either term, 3-0-0).

PHIL 516. *Wittgenstein.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 519. *Problems in Philosophy I.* ★3 (either term, 3-0-0).

PHIL 520. *Problems in Philosophy II.* ★3 (either term, 3-0-0).

PHIL 522. *Moral Philosophy.* ★3 (either term, 3-0-0).

PHIL 524. *Social and Political Philosophy I.* ★3 (either term, 3-0-0).

PHIL 525. *Social and Political Philosophy II.* ★3 (either term, 3-0-0).

PHIL 526. *Aesthetics I.* ★3 (either term, 3-0-0).

PHIL 527. *Aesthetics II.* ★3 (either term, 3-0-0).

PHIL 528. *Philosophy of History.* ★3 (either term, 3-0-0).

PHIL 531. *Existentialism.* ★3 (either term, 3-0-0).

PHIL 536. *Phenomenology I.* ★3 (either term, 3-0-0).

PHIL 537. *Phenomenology II.* ★3 (either term, 3-0-0).

PHIL 545. *Metaphysics I.* ★3 (either term, 3-0-0).

PHIL 548. *Conference Course.* ★6 (3-0-0).

PHIL 549. *Conference Course.* ★3 (either term, 3-0-0).

PHIL 552. *Honors Tutorial III.* ★3 (First Term, 3-0-0).

PHIL 553. *Honors Tutorial IV.* ★3 (Second Term, 3-0-0).

PHIL 554. *Theory of Value.* ★3 (either term, 3-0-0).

PHIL 556. *Kant.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 557. *Philosophy of Religion I.* ★3 (either term, 3-0-0).

PHIL 558. *Philosophy of Religion II.* ★3 (either term, 3-0-0).

PHIL 559. *Topics in Philosophy of the Social Sciences.* ★3 (either term, 3-0-0).

PHIL 561. *Topics in Logic I.* ★3 (either term, 3-0-0).

PHIL 562. *Topics in Logic II.* ★3 (either term, 3-0-0).

PHIL 563. *Epistemology I.* ★3 (either term, 3-0-0).

PHIL 564. *Philosophy of Science I.* ★3 (either term, 3-0-0).

PHIL 565. *Metaphysics II.* ★3 (either term, 3-0-0).

PHIL 566. *Epistemology II.* ★3 (either term, 3-0-0).

PHIL 567. *Philosophy of Science II.* ★3 (either term, 3-0-0).

PHIL 568. *Philosophy of Mind I.* ★3 (either term, 3-0-0).

PHIL 569. *Philosophy of Mind II.* ★3 (either term, 3-0-0).

PHIL 570. *Philosophy of Language I.* ★3 (either term, 3-0-0).

INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0). (See § 44.22.)

INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0). (See §44.22.)

PHIL 571. *Contemporary Topics I.* ★3 (either term, 3-0-0).

PHIL 572. *Philosophy of Language II.* ★3 (either term, 3-0-0).

PHIL 573. *Contemporary Topics II.* ★3 (either term, 3-0-0).

PHIL 575. *Contemporary Topics III.* ★3 (either term, 3-0-0).

PHIL 577. *Contemporary Topics IV.* ★3 (either term, 3-0-0).

PHIL 580. *Topics in Philosophy of Law.* ★3 (either term, 3-0-0).

PHIL 581. *Directed Reading I.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

PHIL 582. *Directed Reading II.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

PHIL 583. *Directed Reading III.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

PHIL 584. *Directed Reading IV.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.

PHIL 676. *Reading Course I.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.

PHIL 677. *Reading Course II.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.

PHIL 678. *Reading Course III.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.

44.29.4 PHILOSOPHY

(from within the Roman Catholic tradition)
St. Joseph's College

The following courses are offered by St. Joseph's College and are accepted for credit in programs offered in the Faculty of Arts.

PHIL 217. *An Introduction to Christian Philosophy.* ★3 (First Term, 3-0-0). A study of early Christian thinkers' use of Greek philosophy, especially St. Augustine's adaptation of Platonism and St. Thomas Aquinas' adaptation of Aristotle. Note: Not available for credit with PHIL 300 or 301.

PHIL 218. *Current Questions in Catholic Philosophy.* ★3 (Second Term, 3-0-0). A philosophical analysis from a Catholic point of view of some recent philosophical positions. The main problems to be looked into will concern God, soul, truth, and goodness.

PHIL 300. *Foundations of Christian Philosophy.* ★3 (First Term, 3-0-0). A study of Greek Philosophy and Hebrew Culture, with development of themes concerning man, human knowledge, nature and ethics in the general thrust of Christian Philosophy. Note: Not available for credit with PHIL 217.

PHIL 301. *Development of Christian Philosophy.* ★3 (Second Term, 3-0-0). A study of the thought of the medieval Christian thinkers, especially Augustine and Thomas Aquinas. Note: Not available for credit with PHIL 217.

PHIL 302. *Philosophy of Man.* ★3 (First Term, 3-0-0). A study of man: His organic existence, his knowledge, his intellectual and emotional love.

PHIL 303. *Man in Society.* ★3 (Second Term, 3-0-0). A study of the person in relationship with others: The notions of law, right, duty, community.

PHIL 304. *Philosophy of Being.* ★3 (Second Term, 3-0-0). The metaphysics of Thomas Aquinas; being, one, true, good, and beauty. Also modern developments and criticism of metaphysics.

PHIL 305 *Ethics in Christianity.* ★3 (First Term, 3-0-0). A philosophic analysis of the roots of contemporary ethics in the Christian tradition.

PHIL 401. *Augustine.* ★3 (Second Term, 3-0-0). A study of the Christian Platonism of St. Augustine. Prerequisite: PHIL 217, 300, or 341, or 459, or consent of the Department.

For Christian Theology courses offered by St. Joseph's College, see § 44.8. For other information see § 246.1.2 of the University Regulations and Information for Students calendar.

44.30 Polish

Department of Slavic Languages

44.30.1 JUNIOR COURSE

POLSH 100. *Beginners' Polish.* ★6 (3-0-2). Essentials of grammar, reading, and drill on useful expressions designed to give a working knowledge of the Polish language.

44.30.2 SENIOR COURSES

POLSH 303. *Second Year Polish I.* ★3 (First Term, 3-0-0). Intermediate grammar, composition, and oral practice based on selected texts of Polish classical and contemporary literature. Prerequisite: POLSH 100 or consent of the Department. Note: Formerly part of POLSH 300.

POLSH 304. *Second Year Polish II.* ★3 (Second Term, 3-0-0). This course is a continuation of POLSH 303, with greater emphasis on reading and composition. Prerequisite: POLSH 303. Note: Formerly part of POLSH 300.

POLSH 411. *Polish Literature to the End of the Nineteenth Century.* ★3 (First Term, 3-0-0). Reading and analysis of the major Polish writers against the political and cultural background of this period. Prerequisite: POLSH 304 or consent of the Department. Note: Formerly POLSH 360.

POLSH 412. *Twentieth-Century Polish Literature.* ★3 (Second Term, 3-0-0). Modern literary movements and writers, with emphasis on the twenties and thirties. Prerequisite: POLSH 411 or consent of the Department. Note: Formerly POLSH 400.

POLSH 421. *Selected Topics in Polish Folklore.* ★3 (either term, 3-0-0). An introduction to Polish folklore. A survey of the national tradition, with analysis of texts in the original. Prerequisites: A senior course in POLSH, and consent of the Department.

POL SH 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chairman for the procedure for student-initiated proposals.

44.31 Political Science

44.31.1 JUNIOR COURSES

POL S 201. *Introduction to Government.* ★3 (either term, 3-0-0). An introduction to the institutions of Canadian and other democratic governments, considering constitutions, legislatures, executives, the public service, courts, federal and other divisions of government authority, and other selected topics. Note: Formerly part of POL S 200.

POL S 202. *Introduction to Politics.* ★3 (either term, 3-0-0). An introduction to the process of democratic politics considering power, or influence, democracy, civil liberties and rights, political ideology, public opinion, elections, political parties, interest groups and other selected topics. Note: Formerly part of POL S 200.

44.31.2 SENIOR COURSES

POL S 300. *Comparative Political Systems.* ★6 (3-0-0). Comparative analysis of selected major political systems of the present day, with emphasis on the relationships between political functions and social processes. Note: Designed primarily as an introductory course at the senior level.

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

INT D 301. *The Hollywood Film.* ★6 (3-0-3). See § 44.22. Accepted as an option only.

POL S 310. *History of Political Thought.* ★6 (3-0-0). A historical and critical survey of the development of political and social philosophy from ancient Greece to the present time, with selected readings from major political writers.

POL S 312. *Ethics and Politics.* ★3 (either term, 3-0-0). The relationship between contemporary ethical theory and normative political analysis.

POL S 316. *Mathematical Applications in Political Science.* ★3 (either term, 3-0-0). An introductory examination of current and potential uses of descriptive and inferential statistics in the study of politics. Prerequisite: Mathematics 30 or equivalent.

POL S 317. *Research Methods and Techniques for Political Analysis.* ★3 (either term, 3-0-0). An examination of basic research methods; techniques for data collection and analysis in political science. Prerequisite: POL S 316 or consent of the Department.

POL S 320. *Canadian National Government and Politics.* ★6 (3-0-0). The structure and function of the government of Canada, especially of the Commons, Senate, Cabinet System, Civil Service, and the role of political parties. Note: Not open to students who have taken POL S 321.

POL S 321. *Canadian Government.* ★3 (either term, 3-0-0). The structure and function of the government of Canada, provincial governments, and local governments. Note: Designed primarily for students who want one senior course in political science. Not open to students who are taking or have taken POL S 200 or 320.

POL S 322. *Local Government and Administration.* ★3 (either term, 3-0-0). The structure and functions of local government in Canada with primary emphasis on the Province of Alberta. Note: Designed primarily for students who want one senior course in political science. Not open to students who are taking or have taken POL S 323.

POL S 323. *Local Government and Politics.* ★3 (either term, 3-0-0). The political process as structured by formal governmental institutions, focusing on local government in Canada. Not open to students who are taking or have taken POL S 322.

POL S 324. *Comparative Urban Political Systems.* ★3 (either term, 3-0-0). A comparative survey of the political processes and structural arrangements of several larger metropolitan regions, with emphasis upon those common conditions and problems which require significant policy decisions.

POL S 325. *Topics in City Politics.* ★3 (either term, 3-0-0). A detailed examination of specific municipal policies. Topics will vary annually. Prerequisite: POL S 322, or 323, or 324.

POL S 326. *Canadian Foreign Policy.* ★6 (3-0-0). Major trends and development in Canadian foreign policy since 1919 with primary emphasis on the period since 1945. Note: No formal prerequisite, but a course or the equivalent, in twentieth century Canadian history would be desirable.

POL S 328. *Elements of Public Administration.* ★3 (either term, 3-0-0). Topics include government organization, budgets, policy-making, and democratic control and accountability. The focus is on Canada, but other countries are also considered.

POL S 331. *Government of the United States.* ★3 (either term, 3-0-0). A study of the development and functioning of American political institutions; congressional government, parties and pressure groups. Note: Formerly a full-session course.

POL S 341. *Soviet Government.* ★3 (either term, 3-0-0). An introduction to political institutions of the USSR, with emphasis on the communist party structure, state apparatus, with aspects of ideology and state theory. Note: Formerly part of POL S 340.

POL S 342. *Problems in Soviet Government.* ★3 (Second Term, 3-0-0). The examination of recurring problems in Soviet Government. Note: Formerly part of POL S 340.

POL S 343. *Soviet Foreign Policy.* ★3 (either term, 3-0-0). Introduction to the foreign policy of the USSR from 1917, but with emphasis on current issues. Note: Formerly part of POL S 446.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.)

POL S 361. *International Relations I.* ★3 (either term, 3-0-0). Factors determining the behavior of states and other actors in the international system. Note: Formerly part of POL S 360.

POL S 362. *International Relations II.* ★3 (either term, 3-0-0). Patterns of relationships between states: war, crises, integration, economic blocs and related topics. Prerequisite: POL S 361 or consent of the Department. Note: Formerly part of POL S 360.

POL S 363. *Issues in International Politics.* ★3 (either term, 3-0-0). Contemporary issues of conflict and cooperation. Note: Designed primarily for students who want one senior course in political science. Not open to students who are taking or have taken POL S 361 or 362.

POL S 372. *Government and Politics of China.* ★3 (either term, 3-0-0). Formerly POL S 472. An introduction to political institutions, political events, and processes in contemporary China.

POL S 373. *Politics in the Middle East.* ★3 (either term, 3-0-0). Formerly POL S 473. Social behavior and attitudes, governmental processes including forms of government, political parties, pressure groups and elections, the role of the civil and military bureaucracy and the political and religious elites and their impact upon national policy formulation are considered. Focus of attention will be upon Turkey, Israel, Iran and Afghanistan.

POL S 374. *Asian Politics: India to Indonesia.* ★3 (either term, 3-0-0). Formerly POL S 474 Social behavior and attitudes, governmental, political parties, pressure groups and elections, the role of civil and military bureaucracy and the political and religious elites and their impact upon national policy formulation. Focus of attention will be upon India, Pakistan, Malaysia and Indonesia.

POL S 376. *Problems of Political Development.* ★3 (either term, 3-0-0). The examination of the common problems of developing nations; political integration, the establishment and maintenance of political order, the role of the military, and the institutionalization of political change.

POL S 380. *Comparative Politics.* ★3 (either term, 3-0-0). An introduction to topics and issues in comparative politics. Note: Formerly POL S 374.

POL S 381. *The Politics of Sub-Saharan Africa.* ★3 (either term, 3-0-0). Formerly POL S 480. Domestic and external pressures on political systems in Sub-Saharan Africa.

POL S 384. *Government of the United Kingdom.* ★3 (either term, 3-0-0). Its structure and functions, especially the monarchy, the cabinet system, parliament, the civil service, and parties.

POL S 386. *Contemporary Western European Politics.* ★3 (either term, 3-0-0). An examination of similarities and differences in the political and governmental processes of contemporary Western Europe. Note: Formerly part of POL S 383.

POL S 390. *Introduction to Political Behavior.* ★3 (either term, 3-0-0). An introduction to political behavior as exhibited in both the public and private political world of the individual. Note: Formerly a full-session course.

POL S 391. *Political Parties of Canada and Other Western Democracies.* ★3 (either term, 3-0-0). A study of the political parties of Canada in comparison with those of other western democracies. Topics include party systems, ideologies and programs, members and supporters, organization and resources, and electoral and governmental activities. Note: Formerly part of POL S 398.

POL S 392. *Interest Groups of Canada and Other Western Democracies.* ★3 (either term, 3-0-0). A study of political interest groups of Canada in comparision with those of other western democracies. Topics include group ideologies and interests, members, organization and resources, and non-governmental and governmental activities. Note: Formerly part of POL S 398.

INT D 393. *Political Sociology.* ★3 (either term, 3-0-0). (See § 44.22.)

POL S 394. *Socialization to Politics.* ★3 (either term, 3-0-0). A survey of major theories and research findings regarding the learning of 'civic' attitudes, and other aspects of political cultures, and their impact on subsequent political behavior.

POL S 395. *Political Attitudes and Ideologies.* ★3 (either term, 3-0-0). A study of political attitudes and ideologies, and of their impact on the individual citizen's involvement in politics.

POL S 396. *Electoral Behavior.* ★3 (either term, 3-0-0). Analysis of the voting behavior of individuals and social groupings. Content will be cross-national in scope and will deal largely with sociological and social-psychological influences on voting.

POL S 397. *Representation and Electoral Systems.* ★3 (either term, 3-0-0). An examination of the institutional framework within which the electoral process operates under representative government, with emphasis on voting as a mechanism of social choice.

NOTE: THE CONSENT OF THE DEPARTMENT IS REQUIRED FOR ALL 400-LEVEL COURSES.

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). (See § 44.22.) Accepted as an option only.

POL S 410. *Topics in Contemporary Political Philosophy I.* ★3 (either term, 3-0-0). A critical examination of contemporary trends in political philosophy.

POL S 411. *Topics in Contemporary Political Philosophy II.* ★3 (either term, 3-0-0). A critical examination of contemporary trends in political philosophy.

POL S 412. *Theories of Political Modernization.* ★3 (either term, 3-0-0). A comparative study of some contemporary theories of political modernization. The course will involve the analysis of various comparative and historical models and approaches, with the intent of developing a critical awareness of the theoretical problems involved in the comparative study of political change.

POL S 414. *Theories of Politics and Society.* ★3 (either term, 3-0-0). Various topics in political and social theory will be considered, centering on special approaches and perspectives in political philosophy.

POL S 415. *Analysis of Political Science.* ★3 (either term, 3-0-0). A philosophical investigation of the basic issues involved in the scientific study of politics. Note: Formerly part of POL S 315.

POL S 416. *Analysis of Political Ethics.* ★3 (either term, 3-0-0). A philosophical investigation of the perennial issues and forms of argument in political ethics. Note: Formerly part of POL S 315.

POL S 417. *Revolution and Political Change.* ★3 (either term, 3-0-0). An examination of some major revolutions of history as well as of political instability of the present. An analysis of social, economic, political, and other factors underlying and accompanying violent political change. Prerequisite: Consent of the Department.

POL S 418. *Twentieth Century Political Thought.* ★3 (either term, 3-0-0). A critical survey of major currents of political and social philosophy in the world today.

POL S 420. *Canadian National Government.* ★3 (either term, 3-0-0).

POL S 421. *Selected problems in Canadian Government.* ★3 (either term, 3-0-0). A discussion of such problems as parliamentary reforms, executive-legislative-judicial relations, etc.

POL S 422. *Canadian Public Policy.* ★3 (either term, 3-0-0). Analysis of Canadian public policy including policy formation and implementation. Attention will be given to specific policy areas such as health and welfare, the economy, agriculture, and communication.

POL S 423. *Canadian Federalism.* ★3 (either term, 3-0-0). The analysis of the development and theories of Canadian Feder-

alism. Attention will be given to current problems of the federal system.

POL S 424. *Canadian Political Behavior.* ★3 (either term, 3-0-0). A behavorial approach to the study of legislative, party, and voting activities.

POL S 425. *Canadian Public Administration.* ★3 (either term, 3-0-0). The theory of public administration and its present day application in the government; federal-provincial relations, planning and finance, human relations, and personnel administration in the Canadian Government. The purpose of the course is to provide a broad overview of the administrative organization and its working in contemporary Canada.

POL S 426. *Civil Service in Canada.* ★3 (either term, 3-0-0). The history, growth, and modernization of the Civil Service Commission of Canada. The organization of government departments and the role and position, the powers and responsibilities, the political rights of Canadian civil servants and the pressures and controls exercised upon them, as well as the role of the ombudsman are also considered.

POL S 427. *Selected Problems in Western Canadian Politics.* ★3 (either term, 3-0-0). A discussion of such problems as the special relationships amongst the three Prairie Provinces, the influence of agricultural interest groups and the reasons for the success of third parties in the four Western Provinces.

POL S 428. *Provincial Government and Politics.* ★3 (either term, 3-0-0). A study of structures, functions and processes of selected provincial governments in Canada. Prerequisite: POL S 320, or 321, or consent of the Department.

POL S 429. *Government and Politics of Alberta.* ★3 (either term, 3-0-0). The study of selected aspects of Alberta government and politics. Topics may range from political institutions, through political parties, to areas of public policy. Prerequisite: POL S 320, or 321, or consent of the Department.

POL S 430. *Public Policy in the Modern State.* ★3 (either term, 3-0-0). An examination of public policy with emphasis on how policy is shaped by the interplay of ideology, political power, and the social and economic development.

POL S 431. *Administrative Behavior.* ★3 (either term, 3-0-0). A study of decision-making, integration and conflict resolution within government and bureaucratic organizations, and of the responsiveness and effectiveness of these organizations, with specific reference to Canada.

POL S 434. *Urban Policy Analysis.* ★3 (either term, 3-0-0). A study of policy formation in selected Canadian and foreign cities. A series of independent variables (socio-economic status, governmental structure, tax base, political culture, party structure) will be examined in order to ascertain their effect on policy outcomes relating to both necessities and amenities in urban areas.

POL S 435. *Problems in Metropolitan Government.* ★3 (either term, 3-0-0). The comparative study of the functional, fiscal, structural and political aspects of metropolitan government.

POL S 442. *Problems in Soviet Government.* ★3 (either term, 3-0-0). Major problems of government and politics in the USSR, primarily domestic. Note: Formerly POL S 342.

POL S 451. *Philosophy and Theory of Law.* ★3 (either term, 3-0-0). The concept of law and its purpose; the role of morality in its development; the function and purpose of law; the nature and role of various legal concepts. Note: Formerly part of POL S 467.

POL S 452. *Selected Topics in Jurisprudential and Governmental Theory.* ★3 (either term, 3-0-0). The discussion of such topics as the concept of sovereignty; the Canadian court system; the differences between civil and criminal law; the differences between colonies and dominions; the status of the Commonwealth and other related matters. Note: Formerly part of POL S 467.

POL S 455. *Strategy and Canadian Defence Policy.* ★3 (either term, 3-0-0). Military strategy viewed from the narrower perspective of Canadian defence policy.

POL S 456. *International Conflict Resolution.* ★3 (either term, 3-0-0). The impact of psychological, national, and systemic variables on international conflict, and conflict-resolution processes.

POL S 457. *Foreign Policy Analysis.* ★3 (either term, 3-0-0). Analysis of those main variables contributing to the formation of the foreign policies of selected nations.

POL S 458. *Foreign Policy.* ★3 (either term, 3-0-0). The foreign policies and strategies of the "major" powers of the world.

POL S 460. *Nationalism, Socialism, and Imperialism.* ★3 (either term, 3-0-0). Relations between rich and poor nations. Impact of nationalism and the break-up of colonial empires; political and economic inequalities; revolutionary and conservative strategies; third-world policies of major powers.

POL S 461. *Selected Problems in International Politics.* ★3 (either term, 3-0-0). The study of selected contemporary problems and / or methods in international relations. Note: Formerly POL S 462.

POL S 464. *Selected Problems in Canadian Foreign Policy.* ★3 (either term, 3-0-0). A discussion of some of the major crises and problems in Canadian foreign policy since 1945 within the context of three or four analytical frameworks.

POL S 465. *International Relations and World Law.* ★6 (3-0-0). The nature of international law; the function of international law in society; the universal character of international law; the state and other international persons; sovereignty and equality; recognition of governments and states; civil war and intervention; war and neutrality; international institutions; world government.

INT D 468. *Principles of International Humanitarian Law.* ★3 (either term, 3-0-0). (See § 44.22.)

POL S 468. *International Organizations.* ★3 (either term, 3-0-0). The historical development, structure, and functions of international organizations. The United Nations will not be considered.

POL S 469. *United Nations.* ★3 (either term, 3-0-0). The history, constitutional structure, and problems, and the effectiveness of social, economic, and political policies of the United Nations.

POL S 471. *Comparative Communist Systems: Soviet and East European.* ★3 (either term, 3-0-0). An analysis and comparison of political culture, social structure, and political institutions in the political processes of the Soviet Union and East European countries.

POL S 475. *Politics of Contemporary Soviet Ukraine.* ★3 (either term, 3-0-0). Post-revolutionary politics and ideologies, with special attention to administrative, institutional and constitutional changes, the nationalities problems and intellectual dissent.

POL S 478. *Problems of Latin American Politics.* ★3 (either term, 3-0-0). An analysis of selected political problems of Latin America; the military; church and state; the Cuban revolution.

INT D 478. *The Multinational Corporation and Public Policy.* ★3 (First Term, 3-0-0). (See § 44.22.) Accepted as an option only.

POL S 479. *The Politics of Latin America.* ★3 (either term, 3-0-0). Comparative analysis of major political systems of Latin America.

INT D 479. *The Multinational Corporation and Public Policy: Case Studies.* ★3 (Second Term, 3-0-0). (See § 44.22.) Accepted as an option only.

POL S 483. *Political Systems, Civil Liberties, and Human Rights.* ★3 (either term, 3-0-0). An analytical and comparative study of the nature, role, and protection of civil liberties and human rights in selected political systems.

POL S 485. *The Development of Western European Politics and Government.* ★3 (either term, 3-0-0). Formerly POL S 385. Patterns in the development of political processes and governmental institutions in Western Europe. Note: Formerly part of POL S 383.

POL S 490. *Selected Topics in Political Behavior.* ★3 (either term, 3-0-0). Detailed examination of special topics of current or historical importance in the field. Topics will vary according to interests. Prerequisite: Consent of the Department.

POL S 492. *Psychology of Politics.* ★3 (either term, 3-0-0). A psycho-political consideration of questions dealing with aggressive political behavior, establishment and erosion of legitimacy, the notions of hierarchy, status, and politics, and questions concerning political socialization and crisis decision-making. Note: Formerly a full-session course.

POL S 493. *Politics and the Film.* ★3 (either term, 3-0-0). The study of the motion picture both as propaganda and as political document. Prerequisite: INT D 300 is strongly recommended as prerequisite or corequisite.

POL S 499. *Honors Essay: Fourth-Year Honors Political Science.* ★6 (3-0-0). Preparation of the Honors essay, required in the fourth year of the Honors program.

44.31.3 HONORS AND GRADUATE COURSES

NOTE: The consent of the Department is required for all 500- and 600-level courses.

POL S 500. *Conference Course.* ★6 (0-3s-0).

POL S 501. *Comparative Institutions and Processes.* ★3 (either term, 0-3s-0).

POL S 502. *Logic of Political Inquiry.* ★3 (either term, 0-3s-0).

POL S 503. *Principles of Research Design and Analysis.* ★3 (either term, 0-3s-0).

POL S 506. *Empirical Political Theory.* ★3 (either term, 3-0-0).

POL S 510. *Advanced Study of Political Thought.* ★6 (3-0-0).

POL S 511. *Topics in Normative Analysis.* ★3 (either term, 3-0-0).

POL S 512. *Modern Social Theory.* ★3 (either term, 3-0-0). Topics will center on problems of contemporary mass culture. Will consider comparatively the approaches and methods of a number of twentieth century social theorists (including Erikson, Weber, Mills, Merleau-Ponty) with the objective of finding traces of normative political theory in the modern era.

POL S 515. *Statistics for Political Scientists.* ★4 (either term, 2-0-2).

POL S 516. *Problems in Marxist Political Theory.* ★3 (either term, 3-0-0).

POL S 521. *Canadian Government and Politics.* ★3 (either term, 3-0-0).

POL S 522. *Canadian Federalism.* ★3 (either term, 3-0-0).

POL S 523. *Canadian Political Parties.* ★3 (either term, 0-3s-0).

POL S 524. *Canadian Political Culture.* ★3 (either term, 3-0-0).

POL S 525. *Urban Analysis.* ★3 (either term 3-0-0).

POL S 526. *Selected Topics in Urban Politics.* ★3 (either term, 3-0-0).

POL S 527. *Canadian Public Policy.* ★3 (either term, 3-0-0).

POL S 528. *The Politics of Public Administration.* ★3 (either term, 3-0-0). Prerequisite: POL S 425 or consent of the Department.

INT D 540. *Seminar on Comparative, Legal, Constitutional and Federal Studies.* ★6 (0-3s-0). (See § 44.22)

POL S 545. *Topics in Communism.* ★3 (either term, 0-3s-0). A seminar on select problems of the Communist bloc and the world Communist movement.

POL S 546. *Seminar in Soviet Government.* ★3 (either term, 0-3s-0). Advanced study of several areas of Soviet domestic politics.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.)

POL S 550. *Comparative Politics: Theory and Analysis.* ★3 (either term, 0-3s-0).

POL S 551. *Comparative Politics: Selected Topics.* ★3 (either term, 3-0-0).

POL S 553. *Comparative Political Activism.* ★3 (either term, 3-0-0).

POL S 554. *Comparative Party and Group Politics.* ★3 (either term, 3-0-0).

POL S 555. *Territorial Organization in Nation States.* ★3 (either term. 0-3s-0).

POL S 560. *International Politics I.* ★3 (First Term, 3-0-0).

POL S 561. *International Politics II.* ★3 (Second Term, 0-3s-0).

POL S 562. *Canadian Foreign Policy.* ★3 (either term, 3-0-0).

POL S 564. *Conflict Resolution and Strategic Studies.* ★3 (either term, 3-0-0).

POL S 570. *Political Development: Theory.* ★3 (either term, 3-0-0).

POL S 571. *Political Development: Selected Topics.* ★3 (either term, 3-0-0).

POL S 578. *Asian Systems.* ★3 (either term, 3-0-0).

POL S 580. *Western European Systems.* ★3 (either term, 0-3s-0).

POL S 581. *Anglo-American Systems.* ★3 (either term, 3-0-0).

POL S 592. *Political Psychology.* ★3 (either term, 3-0-0).

POL S 593. *Political Behavior.* ★3 (either term, 3-0-0). Government and politics from a sociological and psychological point of view, including parties and pressure groups, public opinion, voting in elections, and voting in legislatures. Formerly a full-session course.

POL S 594. *The Comparative Study of Political Mass Movement.* ★3 (either term, 0-3s-0).

POL S 599. *Research Seminar for Non-Thesis M.A. Candidates.* ★6 (0-3s-0). Required of all non-thesis M.A. candidates in the year in which they expect to obtain their degree and involving the preparation and presentation of a major research paper.

POL S 607. *Comparative Federal Systems.* ★3 (either term, 3-0-0).

POL S 608. *Advanced Study in Comparative Politics.* ★3 (either term, 3-0-0).

POL S 609. *Readings in Comparative Politics.* ★3 (either term, 0-3s-0).

POL S 611. *Seminar in Contemporary Political Philosophy.* ★3 (either term, 0-3s-0).

POL S 612. *Topics in Classical Political Philosophy.* ★3 (either term, 3-0-0). Will examine some fundamental characteristics of seventeenth century Rationalist political thought, concentrating on Descartes, Hobbes, Spinoza, and perhaps Locke. Matters of political obligation and political knowledge will be explored in terms of the great themes of science and epistemology which were being developed at that time with the objective of gaining critical analysis of the impact of this area on current political science and philosophy.

POL S 614. *Topics in the Logic of Political Inquiry.* ★3 (either term, 3-0-0). Intensive examination of selected topics in the logic of political inquiry. Topic to change from year to year. Typical topics: the relationship between concept formation and theory construction in political science; the explanation and prediction of political phenomena; reductionism. Prerequisite: POL S 502.

POL S 619. *Readings in Political Philosophy.* ★3 (either term, 3-0-0).

POL S 620. *Topics in Canadian Government and Politics.* ★3 (either term, 3-0-0).

POL S 625. *Readings in Urban Analysis.* ★3 (either term, 0-3s-0).

POL S 626. *Administrative Practices.* ★3 (either term, 3-0-0).

POL S 629. *Readings in Canadian Government and Politics.* ★3 (either term, 0-3s-0).

POL S 660. *International Politics.* ★3 (either term, 3-0-0).

POL S 663. *Problems of International Organization.* ★3 (either term, 3-0-0).

POL S 668. *Readings in International Studies.* ★3 (either term, 3-0-0).

POL S 690. *Research Practicum in Political Behavior and Psychology.* ★3 (either term, 3-0-0). Prerequisite or corequisite: POL S 592 or 593.

POL S 695. *Advanced Topics in Political Behavior and Psychology.* ★3 (either term, 3-0-0). Prerequisite or corequisite: POL S 592 or 593.

POL S 699. *Readings in Political Behavior and Psychology.* ★3 (either term, 3-0-0).

44.32 Psychology

44.32.1 JUNIOR COURSE

NOTE: Psychology 260, a prerequisite for most courses in the Department, is to be found in the Science section of this calendar.

Students with credit in Psychology 202, 212, or Educational Psychology 269/271, may not take Psychology 260/261 for degree credit.

PSYCO 261. *Individual and Social Behavior.* ★3 (either term, 3-0-0). Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be included. Prerequisite: PSYCO 260.

44.32.2 SENIOR COURSES

Psychology 202 or Psychology 260 and any one of 237, 241, 283 is the equivalent of 260/261.

PSYCO 306. *Honors Seminar.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department. Note: Required of all second-year students enrolled in Honors Psychology. Note: Formerly part of PSYCO 301.

PSYCO 307. *Honors Seminar.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department. Note: Required of all second-year students enrolled in Honors Psychology. Note: Formerly part of PSYCO 301.

PSYCO 337. *Individual Differences.* ★3 (either term, 3-0-0). A survey of the biological and social conditions contributing to variations among individuals; methods for describing individuality. Prerequisites: PSYCO 260/261 or equivalent and 309.

PSYCO 341. *Social Psychology.* ★3 (either term, 3-0-0). An advanced course in social psychology. There may be an in-depth investigation of one or more of the following topics: socialization, attitudes, person perception, aggression, or group processes. Prerequisites: PSYCO 260/261 or equivalent. Note: PSYCO 341 and SOC 341 may not both be taken for credit.

PSYCO 353. *Developmental Psychology.* ★3 (either term, 3-0-0). Behavior as it is related to normal development and aging. Prerequisites: PSYCO 260/261 or equivalent.

PSYCO 358. *Cognitive Psychology.* ★3 (First Term, 3-0-0). Surveys theoretical and empirical approaches toward issues in human cognition. Topics include: nature of mental representation; influence of knowledge on perception, comprehension, and memory; information processing; psycholinguistics; artificial intelligence. Prerequisite: PSYCO 260. Note: Formerly part of PSYCH 465 (in Science Calendar).

PSYCO 383. *Personality.* ★3 (either term, 3-0-0). An introductory survey including representative theoretical points of view and research relevant to the major problems of the study of personality. Prerequisites: PSYCO 260/261 or equivalent.

PSYCO 404. *Contemporary Psychology I.* ★3 (First Term, 3-0-0). A study of theories and trends in present day psychology. Prerequisite: Consent of the Department.

PSYCO 405. *Contemporary Psychology II.* ★3 (Second Term, 3-0-0). Further study of prominent theories and thoughts in present day psychology. Prerequisite: Consent of the Department.

PSYCO 406. *Honors Seminar.* ★3 (First Term, 0-3s-2). Prerequisite: Consent of the Department. Note: Required of all third-year students enrolled in Honors Psychology. Note: Formerly part of PSYCO 401.

PSYCO 407. *Honors Seminar.* ★3 (Second Term, 0-3s-2). Prerequisite: Consent of the Department. Note: Required of all third-year students enrolled in Honors Psychology. Note: Formerly part of PSYCO 401.

PSYCO 420. *Principles of Psychology.* ★3 (either term, 3-0-0). Basic concepts and principles of psychology. Prerequisite: Third or fourth year, or graduate standing. Note: Carries no credit for students with credit in any of PSYCO 202, 212, 237, 241, 260, 261, or 283.

PSYCO 431. *Theory and Practice of Psychometrics.* ★3 (either term, 3-0-3). The nature of psychological tests; survey of the various types of standardized tests; some practical work in administration, scoring and interpretation of tests. Prerequisites: PSYCO 260/261 (or equivalent) and 309.

PSYCO 435. *Introduction to Clinical Psychology.* ★3 (Second Term, 3-0-0). History, theory and problems of the application of the psychological knowledge to practical situations. Prerequisite: PSYCO 489 or consent of the Department.

PSYCO 441. *Experimental Social Psychology.* ★3 (either term, 3-0-2). An intensive study of methods for investigating social behavior. The evaluation of published research, design of experiments, analysis and communication of results will be stressed. Opportunity for supervised research projects. Prerequisites: PSYCO 260/261 (or equivalent), 309, and one of PSYCO 360, 361, 362 (or 365) or 366.

PSYCO 444. *Decision Making.* ★3 (either term, 3-0-2). An overview of theory and research on human decision-making processes. Topics include: A history of decision-making research, recent models of judgment and choice, psychological aspects of decision-making in law and politics, errors of judgment and possibilities of their reduction. Prerequisites: PSYCO 260/261 and 309 (or equivalent).

PSYCO 445. *Foundations of Current Social Psychological Perspectives.* ★3 (either term, 3-0-0). Theories in social psychology are discussed with emphasis on principles of theory construction. Prerequisites: PSYCO 260, 261, and 341 or consent of the Department.

PSYCO 454. *Perceptual and Cognitive Development.* ★3 (either term, 3-0-0). The development of the ability to process information from the environment. Attention, memory, and concept formation in infants and young children. Prerequisite: PSYCO 353 or consent of the instructor. Note: Formerly PSYCO 354, not to be taken by students with credit in that course.

PSYCO 455. *Personality and Social Development.* ★3 (First Term, 3-0-0). A review of psychological theory and research on age trends and individual differences in personality and social development.

PSYCO 458. *Advanced Cognitive Psychology.* ★3 (Second Term, 3-0-0). Focus on discussing published research in a particular area of human cognition using theoretical and methodological evaluative criteria. Opportunity for supervised research. Prerequisite: PSYCO 309, and 385, or 362, and consent of the instructor. Note: Formerly part of PSYCO 465.

PSYCO 489. *Abnormal Psychology.* ★3 (either term, 3-0-0). A general introduction. Prerequisite: PSYCO 383.

PSYCO 491. *Psychology of Self-Estrangement.* ★3 (Second Term, 3-0-0). Basic description of self-deception and self-estrangement in psychoanalytic and existential-humanistic theories. Discussion of basic determinants of self-deception and, alternatively, self-awareness, as well as considerations of the methods of inquiry appropriate to the area. Prerequisite: PSYCO 383.

PSYCO 492. *Creativity.* ★3 (First Term, 3-0-0). A course directed at the understanding of the creative process on theoretical, empirical, and phenomenological levels. Prerequisite: PSYCO 261.

PSYCO 495. *Psychology of Aesthetics.* ★3 (Second Term, 3-0-0). An introduction to the psychological analysis of response to art. Consideration is both theoretical and empirical. Illustrative materials are drawn from several arts, including painting, sculpture and literature. The contribution of aesthetic behavior to personality development is considered. Prerequisites: PSYCO 260/261 (or equivalent).

PSYCO 498. *Individual Study I.* ★3 (First Term, 3-0-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. The pursual may take the form of either directed reading or laboratory experience. Prerequisite: Consent of the Department.

PSYCO 499. *Individual Study II.* ★3 (Second Term, 3-0-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. The pursual may take the form of either directed reading or laboratory experience. Prerequisite: Consent of the Department.

44.32.3 HONORS AND GRADUATE COURSES

INT D 500. *Nature of Man.* ★6 (3-0-0). (See § 44.22.)

PSYCO 534. *Principles of Psychological Assessment.* ★3 (Second Term, 3-0-0). Major concepts and instruments of clinical assessment. Relationship of assessment to other clinical activities; objective approaches to measuring personality and intelligence; projective techniques; behavioral assessment methods. Prerequisite: Consent of the Department.

PSYCO 535. *Clinical Assessment I.* ★6 (3-0-3). Tests of intellectual function from Binet to the present. Prerequisite: PSYCO 431 or consent of the Department.

PSYCO 536. *Clinical Assessment II.* ★6 (3-0-3). Theory of projective tests, with study of the Rorschach and the various drawing and thematic tests. Prerequisite: PSYCO 535 or consent of the Department.

PSYCO 537. *Clinical Method I.* ★6 (4-0-0). Conference course. Principles involved in the analysis of case material. Prerequisite or corequisite: PSYCO 536, 586, or consent of the Department.

PSYCO 539. *Clinical Method II.* ★6 (3-0-3). Conference course. Principles of analysis, reporting, and psychotherapy. Prerequisite or corequisite: PSYCO 537, 588, 590, or consent of the Department.

PSYCO 540. *Seminar in Social Psychology.* ★6 (0-3s-0).

PSYCO 541. *Advanced Social Psychology.* ★3 (First Term, 3-0-0).

PSYCO 542. *Research Methods in Social Psychology.* ★3 (Second Term, 3-0-0).

PSYCO 543. *Social and Personality Development.* ★3 (Second Term, 3-0-0). Theory and research on social and personality development, including topics such as social learning processes, sex typing, and social-cognitive development.

PSYCO 550. *Experimental Analysis of Personality.* ★3 (either term, 3-0-0). Latest techniques for measurement and experimental study of such personality factors as neuroticism, anxiety, hysteria, extroversion, conflict, and motivation structure. Prerequisites: PSYCO 202, or 260 and 261; and 383, or consent of the Department.

INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0). (See § 44.22.)

INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0). (See § 44.22.)

PSYCO 580. *Advanced Psychology of Personality.* ★3 (Second Term, 3-0-0).

PSYCO 584. *Seminar in Personality Theory.* ★3 (0-3s-0). Prerequisites: PSYCO 383 or consent of the Department.

PSYCO 585. *Seminar in Theories of Perception.* ★3 (either term, 0-3s-0).

PSYCO 587. *Basis of Abnormal Behavior.* ★3 (First Term, 3-0-0). Psychopathological behaviors. Major classification systems; methodological problems; models of etiology; related experimental findings. Prerequisite: Consent of the Department.

PSYCO 588. *The Psychoses.* ★6 (3-0-0). The symptoms and dynamics of the major functional psychoses. Prerequisite: Consent of the Department.

PSYCO 591. *Approaches to Treatment.* ★3 (Second Term, 3-0-0). Major treatment approaches to problems of adjustment including psychodynamic, behavioral, humanistic, psychophysiological, and group methods. Prerequisite: Consent of the Department.

PSYCO 592. *Psychological Therapies.* ★6 (3-0-3). Psychological therapies, with practical instruction in selected techniques. Prerequisite: Consent of the Department.

PSYCO 599. *Honors Thesis.* ★6 (0-0-6). Students in their fourth year of honors will pursue a research project under the direction of a member of the Department.

PSYCO 614. *Special Topics in Social Psychology.* ★3 (First Term, 3-0-0).

PSYCO 615. *Topics in Social Psychology.* ★3 (Second Term, 3-0-0).

PSYCO 616. *Special Topics in Personality.* ★3 (First Term, 3-0-0).

PSYCO 617. *Topics in Personality.* ★3 (Second Term, 3-0-0).

PSYCO 618. *Special Topics in Clinical Psychology.* ★3 (First Term, 3-0-0).

PSYCO 619. *Topics in Clinical Psychology.* ★3 (Second Term, 3-0-0).

PSYCO 620. *Special Topics in Cognition.* ★3 (First Term, 3-0-0).

PSYCO 621. *Topics in Cognition.* ★3 (Second Term, 3-0-0).

PSYCO 622. *Special Topics in Developmental Psychology.* ★3 (First Term, 3-0-0).

PSYCO 623. *Topics in Developmental Psychology.* ★3 (Second Term, 3-0-0).

PSYCO 648. *Research.* ★3 (First Term, 3-0-3).

PSYCO 649. *Research.* ★3 (Second Term, 3-0-3).

PSYCO 668. *Seminar in Theoretical Psychology I.* ★3 (First Term, 0-3s-0). An in-depth examination of the logical structure and empirical support of major theories in psychology.

PSYCO 669. *Seminar in Theoretical Psychology II.* ★3 (Second Term, 0-3s-0). An in-depth examination of the logical structure and empirical support of major theories in psychology.

PSYCO 672. *History of Psychology.* ★3 (either term, 3-0-0).

PSYCO 698. *Advanced Research Techniques I.* ★6 (First Term, 0-3L-0). Supervised experience in specialized research techniques.

PSYCO 699. *Advanced Research Techniques II.* ★6 (Second Term, 0-3L-0). Supervised experience in specialized research techniques.

44.33 Religious Studies

[Preface: The courses listed below represent an extensive reorganization and modification of the Department's offerings. Because of changes in course numbers and/or content, students should compare their new course selections with courses previously taken so as to avoid duplication or overlap.]

44.33.1 JUNIOR COURSE

RELIG 200. *Introduction to the Study of Religion.* ★6 (3-0-0). The origin and development of the history of religions as a separate academic discipline. Principles and methods of this discipline. Some account of the major living religions in their history and distinctive features.

44.33.2 SENIOR COURSES

RELIG 300. *Introduction to the Religions of the East.* ★6 (3-0-0). An introductory survey of the religions of India, China, Japan, South-East Asia, including some account of the growth in the appreciation of the religions by the West and the interrelationship of cultural values of East and West.

RELIG 301. *Hinduism I: Early Religious Thought of India.* ★3 (either term, 3-0-0). Study of the religion of the Vedas and the Upanishads, with the help of selected texts.

RELIG 303. *Buddhism in India: Hinayana.* ★3 (First Term, 3-0-0). The origin and growth of early Buddhism up to and including the development of the Hinayana tradition.

RELIG 304. *Buddhism in India: Mahayana.* ★3 (Second Term, 3-0-0). The form of later Buddhism in India. Prerequisite: RELIG 303. Note: Formerly part of RELIG 315/316.

RELIG 306. *The Bhagavad Gita.* ★6 (3-0-0). Critical study of the Text.

RELIG 307. *The Yogacara.* ★3 (either term, 3-0-0). The religious idealism of one of the two major schools of the Mahayana.

RELIG 308. *Introduction to the Six Systems of Indian Philosophy.* ★3 (either term, 3-0-0). An overview of the classical religious philosophies of India. Note: Formerly RELIG 302.

RELIG 309. *The Religions of India Through Art.* ★3 (either term, 3-0-0). A study of the religions of India through the art and architecture of Hinduism, Buddhism, Jainism, and Islam.

RELIG 311. *Japanese Religions.* ★6 (3-0-0). An introduction to the various Japanese religions, with special emphasis on some fundamental themes underlying myths, symbols, rituals and institutions.

RELIG 312. *Japanese Religious Thought.* ★3 (either term, 3-0-0). An examination of the perception of the Divine, of Nature, of Man embodied in the way of thinking and religious ideas of the Japanese. Note: Formerly part of RELIG 317.

RELIG 313. *Zen and Japanese Culture.* ★3 (either term, 3-0-0). A study of the history, nature, and meaning of Zen Buddhism, and its influence on various religious-aesthetic expressions of Japanese culture.

RELIG 314. *Japanese Buddhism.* ★3 (either term, 3-0-0). A study of the history and the structure of Japanese Buddhism, as distinct from Indian and Chinese Buddhism. Note: Formerly RELIG 318.

RELIG 315. *Chinese Religious Thought.* ★3 (either term, 3-0-0). An examination of the perception of the Divine, of Nature, of Man in the way of thinking and religious ideas of the Chinese. Note: Formerly part of RELIG 317.

RELIG 316. *Taoism and Chinese Culture.* ★3 (either term, 3-0-0). A study of the history and the structure of Taoism, and its influence on the life, thought, and culture of the Chinese people.

RELIG 319. *Chinese Buddhism.* ★3 (either term, 3-0-0). A study of the distinctive features of Chinese Buddhism, with particular reference to the origin and development of Chinese Zen (Ch'an) and to its meaning for East Asian Civilization.

RELIG 321. *Islam.* ★6 (3-0-0). A survey of the main elements of the Muslim tradition and their role in the formation of Islamic culture.

RELIG 322. *Islamic Religious Diversity.* ★3 (either term, 3-0-0). Examines the development of sectarian division among Muslims with their religious and political implications.

RELIG 323. *The Encounter of Islam and Christendom.* ★3 (either term, 3-0-0). Cultural and religious interaction of two world traditions.

RELIG 324. *Sufism.* ★3 (either term, 3-0-0). Historical and doctrinal examination of the great Muslim mystics and their teaching. Note: Formerly RELIG 402.

RELIG 325. *Islamic Religious Thought.* ★3 (either term, 3-0-0). A study of the meaningful expressions of the Muslims' attempts to give intellectual expressions of their faith in different periods of their history. Note: Formerly RELIG 403.

RELIG 326. *Muhammad the Prophet.* ★3 (either term, 3-0-0). A historical and thematic investigation of the career and religious impact of the Prophet.

RELIG 327. *Qur'ānic Studies.* ★3 (either term, 3-0-0). An examination of the style, structure, and doctrine of the Qur'ān.

RELIG 328. *Contemporary Islamic Religious Movements.* ★3 (either term, 3-0-0). Recent developments in the philosophical, social, and religious life of Islam throughout the world.

RELIG 329. *Islam through Cultural Forms.* ★3 (either term, 3-0-0). The religious vision of Islam through art, literature, and architecture.

RELIG 330. *The Pentateuch.* ★3 (either term, 3-0-0). A text-critical examination of the history, literature, and theology of Genesis, Exodus, Leviticus, Numbers, and Deuteronomy.

RELIG 331. *Introduction to the Old Testament.* ★3 (either term, 3-0-0). Introduction to the theology and history of the Old Testament.

RELIG 332. *Religious Developments of the Intertestamental Period.* ★3 (either term, 3-0-0). History and literature of the period between the Old and New Testaments, including: Apocalyptic, Pseudepigrapha, Dead Sea Scrolls, etc.

RELIG 333. *Religious Significance of the Prophets.* ★3 (either term, 3-0-0). The origin, meaning, and nature of prophecy in Ancient Israel and its modern relevance.

RELIG 335. *Religious Thought in Judaism.* ★6 (3-0-0). History and ideas of Jewish Philosophy and Mysticism from Rabbinic to Modern Times.

RELIG 336. *The History of the Jewish Ethical Tradition.* ★3 (either term, 3-0-0). The moral dilemmas of man in the light of Jewish ethical traditions.

RELIG 337. *Folkways, Mores, and Institutions of the Jewish People.* ★3 (either term, 3-0-0). An examination of the origin and development of the institutions of Jewish life from Biblical to Modern Times.

RELIG 338. *Judaism and the Jewish People.* ★6 (3-0-0). The history of Judaism and of the Jewish people from Second Temple through World War II. Note: Formerly RELIG 340.

RELIG 339. *Religious Movements and Ideologies in Modern Judaism.* ★3 (either term, 3-0-0). An analysis of the Jewish community in the twentieth century, its development and change as influenced by history, philosophy, and theology.

RELIG 342. *Gnosticism and the Occult.* ★3 (either term, 3-0-0). A study of Gnosticism in the early Christian period with special reference to the newly published Gnostic literature and an investigation of five esoteric occult systems: astrology, natural or white magic, witchcraft, alchemy, and hermetic religious thought in the Renaissance.

RELIG 347. *Use of Old Testament in New Testament.* ★3 (either term, 3-0-0). A study of the use of the Old Testament in the New Testament, including a study of the relation of the two testaments.

RELIG 348. *The Christian Tradition.* ★3 (Second Term, 3-0-0). This course will focus on classical themes in Christianity which have persisted from New Testament to modern times: the message of Jesus, Kerygma, Church Order, Development of Doctrine, The Canon of Scripture, Church and State, Scripture and its Interpretation. Note: Formerly RELIG 364.

RELIG 349. *Primitive Christian Literature.* ★3 (either term, 3-0-0). Introduction to the New Testament, Apocrypha, and Apostolic Fathers, and a comparative and historical study of their literary images. Note: Not open to students with credit in RELIG 350.

RELIG 350. *Jesus of Nazareth.* ★3 (either term, 3-0-0). A study of the life, death, and resurrection of Jesus, and his influence in history.

RELIG 351. *Synoptic Gospels.* ★6 (3-0-0). A comparative and historical analysis of the purpose, characteristics, and problems of the first three gospels.

RELIG 352. *The Johannine Literature.* ★6 (3-0-0). Comparative and historical study of the Johannine writings.

RELIG 353. *The New Testament Epistles.* ★6 (3-0-0). A historical and comparative study.

RELIG 354. *The Markan Gospel.* ★3 (either term, 3-0-0). A detailed exegetical study.

RELIG 356. *Christian Theology I.* ★3 (either term, 3-0-0). The emergence of the Catholic tradition and the growth of medieval theology to 1300.

RELIG 357. *Christian Theology II.* ★3 (either term, 3-0-0). The spirit of eastern Christendom, reformation, and modern theology to present time.

RELIG 358. *The Institutes of John Calvin.* ★3 (either term, 3-0-0). The theology of Calvin as found in the Institutes.

RELIG 359. *Theology of Luther.* ★3 (either term, 3-0-0). A critical study of the genesis, development, and structure of Luther's theology.

RELIG 360. *The Concept of Deity.* ★6 (3-0-0). Different concepts of God as found in the major religions of the world.

RELIG 361. *Religious Symbolism.* ★3 (either term, 3-0-0). A comparative study of religious symbols in the various religions of the world; primitive, classical and modern. Attention will be given to different approaches and methods.

RELIG 363. *Religious Founders.* ★3 (either term, 3-0-0). An examination of the lives of the founders of the world's major religious traditions with special attention to their interpretation in devotional literature.

RELIG 365. *Comparative Studies in Religious Mythology.* ★3 (either term, 3-0-0). An introduction to the modern study of religious mythology in several cultures. Focus on some major mythic themes such as creation, origin of death, etc.

RELIG 366. *Shamanism.* ★3 (either term, 3-0-0). A study of shamanism in the history of religions with special attention to myths, rituals, symbols, and the ecstatic experience.

RELIG 371. *Myth and Truth in Religious Thought.* ★6 (3-0-0). An introduction to the problems raised by religious languages, and the claim of religious teaching to embody truth in a distinctive fashion. Note: Formerly RELIG 420.

RELIG 372. *Contemporary Religious Thought.* ★6 (3-0-0). A survey of modern religious thought. Note: Formerly RELIG 401.

RELIG 373. *Modern Religious Perspectives.* ★3 (either term, 3-0-0). Contemporary problems in religious ethics and their impact on collective decision-making in the areas of politics, medicine, law, etc. Note: Formerly RELIG 390.

RELIG 374. *Religion and Social Change.* ★3 (either term, 3-0-0). Critical analysis of the mutual influence of religion and society with regard to change in comparative perspective.

RELIG 375. *Thanatology.* ★3 (either term, 3-0-0). A consideration of death and dying in the great religious traditions, with particular emphasis on the recent literature.

RELIG 380. *Religious Beliefs of Native Peoples.* ★3 (either term, 3-0-0). A consideration of the religious beliefs of the Eskimos and North American Indians.

RELIG 381. *Themes of Pre-literate Religious Tradition.* ★3 (either term, 3-0-0). A study of specific themes in the religious life of pre-literate peoples, e.g., shamanism, myths, revitalization movements, etc. Note: Formerly RELIG 310.

RELIG 385. *Religions of Western Canada.* ★3 (either term, 3-0-0). A survey of the history, structure and socio-cultural impact of religious groups in Western Canada. Note: Formerly RELIG 355.

RELIG 405. *Religions of the Ancient Near East.* ★3 (3-0-0). The religions of Persia and Egypt.

RELIG 406. *The Madhyamika.* ★3 (either term, 3-0-0). A study in depth of the religious philosophy of Nagarjuna.

RELIG 407. *The Vedanta.* ★3 (either term, 3-0-0). A study in depth of the religious philosophy of Shankara and his followers.

RELIG 408. *The Tantra.* ★3 (either term, 3-0-0). Study of Tantric esotericism, its principles, its aesthetic expressions, and its influence on the religion of Tibet, Nepal, and India.

RELIG 410. *Myths, Legends, and Folklore in Japan.* ★3 (either term, 3-0-0). An intensive study of the structure and meaning of Japanese myths and folklore from a comparative, cross-cultural perspective.

RELIG 411. *Myths, Legends, and Folklore in China.* ★3 (either term, 3-0-0). An intensive study of the structure and meaning of Chinese myths, and legends, and folklore. Attention will be given to different approaches and methods.

RELIG 412. *Taoism.* ★3 (either term, 3-0-0). An intensive study of the structure and meaning of Taoism. Attention will be given to different approaches and methods. Note: Formerly RELIG 320.

RELIG 425. *Islamic Religous Texts.* ★3 (either term, 3-0-0). Study of hadith, exegetical literature and theological writings.

RELIG 430. *Studies in Old Testament Texts.* ★3 (either term, 3-0-0). Detailed study of individual books of the Old Testament and related themes. Prerequisite: RELIG 331 or 333 or consent of the Department. Note: Formerly RELIG 334.

RELIG 431. *Studies in Rabbinic Texts.* ★6 (3-0-0). The theology of Rabbinic Judaism examined through selections from the Mishna, Talmud, Tosefta, and Midrash.

RELIG 451. *Mysticism.* ★6 (3-0-0). This course will examine religious man's mystical experiences in different traditions, *homo religiosus* in the face of the ultimate. Note: Formerly RELIG 319.

RELIG 460. *Religious Hermeneutics.* ★6 (3-0-0). A critical study of how one interprets religious documents with examples from world religions.

RELIG 462. *Methodology in Religious Studies.* ★6 (3-0-0). A study of how one arrives at normative patterns.

RELIG 465. *Myths and Symbols.* ★3 (either term, 3-0-0). An intensive study of recent theories of religious myths and symbols. Note: Formerly RELIG 415.

RELIG 480. *Directed Reading in Religious Studies.* ★6 (3-0-0). Prerequisite: Consent of the Department.

RELIG 481. *Directed Reading in Religious Studies.* ★3 (either term, 3-0-0).

RELIG 482. *Directed Reading in Religious Studies.* ★3 (either term, 3-0-0).

RELIG 499. *Reading Seminar.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

RELIG 510. *Topics in Indian Religions.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Examination of the main religious and philosophical themes in Vedas, Upanishads, Vedanta.

RELIG 511. *Topics in Islam.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

RELIG 512. *Topics in East Asian Religions.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

RELIG 513. *Topics in Judaism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

RELIG 514. *Topics in Christianity.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

NOTE: Courses of related interest offered by affiliated colleges are listed in § 44.8 and 44.28. For other information see § 246 of University Regulations and Information for Students Calendar.

44.34 Romance Linguistics

Department of Romance Languages

44.34.1 SENIOR COURSES

R LIN 360. *The Structure of Romanian.* ★3 (either term, 3-0-0). An introduction to the phonology and syntax of Romanian with a brief consideration of its relationship to other Romance languages. Prerequisite: Consent of the Department.

R LIN 372. *French Phonetics.* ★3 (either term, 3-0-0). An introduction to French phonetics focusing on the recognition and elimination of pronunciation difficulties for English speakers. Francophones are advised to take R LIN 320 (Faculté Saint-Jean) but may be accomodated in R LIN 372. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean LIN R 320.

R LIN 375. *The Grammatical Structure of French.* ★3 (either term, 3-0-0). A linguistic introduction to the parts of speech and to sentence structure. Prerequisite: Any 200-level French course except FREN 205 or 206. Note: Not open for credit to students having credit or registered in R LIN 370 or Faculté Saint-Jean LIN R 321.

R LIN 380. *The Structure of Spanish.* ★3 (either term, 3-0-0). An introduction to the phonology and syntax of Spanish with a brief consideration of its relationship to other Romance languages.

R LIN 390. *The Structure of Italian.* ★3 (either term, 3-0-0). An introduction to the phonology and syntax of standard Italian with a brief consideration of its relationship to Italian dialects. Prerequisite: ITAL 100 or consent of the Department. Note: Formerly R LIN 391.

R LIN 395. *Introduction to the Romance Languages.* ★3 (either term, 3-0-0). The modern Romance languages, their structure and interrelationships.

R LIN 397. *Introduction to Historical Romance Linguistics.* ★3 (either term, 3-0-0). The major phonological and grammatical changes from Latin to the modern Romance Languages are presented in relation to certain basic theories and methods of historical linguistics.

R LIN 401. *Applied Linguistics: French Phonology.* ★3 (either term, 3-0-0). An in-depth study of the French sound system, with an introduction to fundamental principles and methods of contrastive phonological analysis. Prerequisite: R LIN 372. Note: Formerly R LIN 373.

R LIN 402. *Applied Linguistics: French Morphology and Syntax.* ★3 (either term, 3-0-0). An in-depth study of the morphological and syntactic structures of French with an introduction to the principles and methods of contrastive grammatical analysis. Prerequisite: R LIN 375. Note: Formerly R LIN 400.

R LIN 474. *The Structure of Canadian French.* ★3 (either term, 3-0-0). Prerequisite: R LIN 372 or 375. Note: Formerly R LIN 374. Students cannot receive credit in both R LIN 474 and 374.

R LIN 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual students. Prerequisite: Consent of the Department.

44.34.2 HONORS AND GRADUATE COURSES

R LIN 501. *Topics in Applied Linguistics: French Phonology.* ★3 (either term, 3-0-0). Prerequisite: R LIN 401.

R LIN 502. *Topics in Applied Linguistics: French Morphology and Syntax.* ★3 (either term, 3-0-0). Prerequisite: R LIN 402.

R LIN 503. *Early Romance.* ★3 (either term, 3-0-0). The linguistic evolution from Latin until the appearance of the first Romance texts. Prerequisites: Two half-courses in Romance linguistics or equivalent. Note: Formerly R LIN 505. Students cannot receive credit in both R LIN 503 and 505.

R LIN 504. *Seminar in Portuguese.* ★3 (Second Term, 0-3s-0). Prerequisite: PORT 502.

R LIN 508. *Seminar in Romanian.* ★3 (Second Term, 0-3s-0). Prerequisite: R LIN 360.

R LIN 511. *Seminar in Applied Romance Linguistics.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Detailed study of a selected topic for Honors or Graduate students.

R LIN 570. *Romance Structure: from Latin to French.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503.

R LIN 580. *Romance Structure: from Latin to Spanish.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503.

R LIN 590. *Romance Structure: from Latin to Italian.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503 or consent of the Department.

R LIN 595. *Seminar in Comparative Romance Linguistics.* ★3 (either term, 3-0-0). Prerequisite: R LIN 503.

R LIN 599. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

R LIN 600. *Diachronic Theories in Romance Linguistics.* ★3 (either term, 3-0-0). A survey of the development of historical linguistic studies in the Romance area, and a comparison of the main contemporary theoretical approaches to Romance diachronic studies.

R LIN 610. *Topics in Romance Linguistics.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

R LIN 611. *Advanced Seminar in Romance Linguistics.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

R LIN 620. *Romance Dialectology.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Study of a specific Romance dialect or groups of dialects.

R LIN 670. *Topics in French Grammar.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

R LIN 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Designed to meet the needs of individual graduate students. A detailed study of a topic not dealt with in other graduate courses.

NOTE: For an additional course related to the above, see FREN 611 in § 44.15.1.

44.35 Romance Literatures

Department of Romance Languages

44.35.1 HONORS COURSE

R LIT 505. *Honors Seminar in Romance Literatures.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0). Prerequisites: Honors standing in Romance Languages. Ability to follow lectures, discuss, and write assignments in more than one Romance language.

44.36 Russian

Department of Slavic Languages

44.36.1 JUNIOR COURSES

RUSS 100. *Beginners' Russian.* ★6 (3-0-2). Essentials of grammar, reading, and drill on useful expressions. Designed to give a working knowledge of the Russian language.

RUSS 106. *Intensive Beginners' Russian I.* ★3 (25-0-5). An 'immersion' course designed to give a working knowledge of Russian, with emphasis on conversational skills. Note: This course is given during the Summer Session only.

RUSS 107. *Intensive Beginners' Russian II.* ★3 (25-0-5). The continuation of RUSS 106. Prerequisite: RUSS 106 or consent of the Department. This is a Summer Session course given in the Soviet Union.

RUSS 210. *Reading Russian.* ★6 (3-0-0). An introduction to the grammar and vocabulary of Russian essential for the comprehension of original texts in the Natural Sciences, Social Sciences or Humanities. Note: Not accepted to meet concentration requirements in Russian, if the principal subject of concentration is Russian.

44.36.2 SENIOR COURSES

RUSS 303. *Second-year Russian I.* ★3 (First Term, 3-0-1). Russian grammar, composition, oral practice, and reading of selected texts of Russian classical and contemporary literature. Prerequisite: RUSS 100, or RUSS 107, or consent of the Department. Note: Formerly part of RUSS 300.

RUSS 304. *Second-Year Russian II.* ★3 (Second Term, 3-0-1). This course is a continuation of RUSS 303. Prerequisite: RUSS 303. Note: Formerly part of RUSS 300.

RUSS 305. *Second-Year Practical Study.* ★3 (0-0-2). Development of oral skills. Recommended for students taking RUSS 303 and 304.

RUSS 306. *Intensive Second-Year Russian I.* ★3 (25-0-5). An 'immersion' course in second-year Russian, with emphasis on conversational skills. Prerequisite: RUSS 100, or 107, or consent of the Department. Note: This course is given during the Summer Session only.

RUSS 307. *Intensive Second-Year Russian II.* ★3 (25-0-5). The continuation of RUSS 306. Prerequisite: RUSS 306 or consent of the Department. Note: This is a Summer Session course given in the Soviet Union.

RUSS 311. *Advanced Reading Russian I.* ★3 (First Term, 3-0-0). A continuation of RUSS 210, this course is designed to give students a sufficient command of the language to enable them to translate advanced Russian texts in their field of study. Prerequisite: RUSS 210 or consent of the Department. Note: Formerly part of RUSS 310.

RUSS 312. *Advanced Reading Russian II.* ★3 (Second Term, 3-0-0). This course is designed as a continuation of RUSS 311; Russian articles of current interest will be discussed and translated. Prerequisite: RUSS 311. Note: Students who obtain a pass grade in this course will be considered by the Department as having satisfied the reading requirement in Russian for the M.Sc. or Ph.D. at The University of Alberta. Note: Formerly part of RUSS 310.

RUSS 315. *Readings in Pre-Twentieth Century Russian Literature.* ★3 (First Term, 3-0-0). Introduction to the study of Russian literature in the original. Assisted reading and analysis of selected texts from pre-twentieth century Russian literature. Corequisite: RUSS 303.

RUSS 316. *Readings in Twentieth-Century Russian Literature.* ★3 (Second Term, 3-0-0). Assisted reading and analysis of selected texts from twentieth-century Russian literature. Corequisite: RUSS 304.

RUSS 320. *Masterpieces of Russian Literature (in Translation).* ★3 (First Term, 3-0-0). A survey of the outstanding authors and literary trends in pre-twentieth century Russian literature with primary emphasis on nineteenth century Romanticism and Realism. Note: Not accepted to meet the requirements in the principal area of concentration, or the second area of concentration, if the principal area is Russian.

RUSS 321. *Twentieth Century Russian Literature (in Translation).* ★3 (Second Term, 3-0-0). A study of pre-revolutionary modernist, early Soviet, and recent Soviet literature. Note: Not accepted to meet the requirements in the principal area of concentration, or the second area of concentration, if the principal area is Russian.

RUSS 323. *Tolstoy and Dostoevsky (in Translation).* ★3 (Second Term, 3-0-0). An in-depth study of Russian literature's foremost novelists of the nineteenth century. Note: Not accepted to meet concentration requirements in Russian, if the principal subject of concentration is Russian.

RUSS 325. *Russian Culture.* ★3 (Second Term, 3-0-0). A survey of Russian culture and civilization stressing major developments in literature and the fine arts. Note: Not accepted to meet concentration requirements in Russian, if the principal subject of concentration is Russian.

RUSS 401. *Third-Year Russian I.* ★3 (First Term, 3-0-0). Discussion of difficult grammatical points in Russian, vocabulary building, development of the comprehension of spoken Russian. Prerequisite: RUSS 304, or 307, or consent of the Department. Note: Formerly part of RUSS 390.

RUSS 402. *Third-Year Russian II.* ★3 (Second Term, 3-0-0). This course is a continuation of RUSS 401, with greater emphasis on composition. Prerequisite: RUSS 401 or consent of the Department. Note: Formerly part of RUSS 390.

RUSS 405. *Third-Year Practical Study.* ★3 (0-0-2). Development of oral skills. Recommended for students taking RUSS 401 and 402.

RUSS 411. *Russian Drama and Theatre.* ★3 (either term, 3-0-0). Studies in the Russian drama from the age of Classicism onward. Prerequisite: RUSS 304, or 307, or consent of the Department.

RUSS 412. *Russian Poetry.* ★3 (either term, 3-0-0). Developments in Russian poetry from the inception of the syllabo-tonic tradition with special emphasis on the nineteenth century. Prerequisite: RUSS 304, or 307, or consent of the Department.

RUSS 413. *Russian Romanticism.* ★3 (either term, 3-0-0). A course devoted both to the study of the formative currents in early nineteenth century Russian literature and to the analysis of representative works by the foremost Russian romanticists — Zhukovsky, Pushkin, Marlinsky, Gogol, Lermontov et al. Prerequisite: RUSS 304, or 307, or consent of the Department.

RUSS 421. *Selected Topics in Russian Folklore.* ★3 (either term, 3-0-0). An introduction to Russian folklore. A survey of the national tradition, with analysis of texts in the original. Prerequisites: A senior course in Russian and consent of the Department.

RUSS 451. *Cultural History of the Russian Language.* ★3 (either term, 3-0-0). The growth and the development of the Russian language from its origins to the present day. Prerequisite: RUSS 304, or 307, or consent of the Department.

RUSS 453. *Russian Phonetics.* ★3 (either term, 3-0-0). Scientific study of Russian sound system. Practice in phonetic discrimination and transcription. Practical exercises to assist a student in improving his pronunciation. Prerequisite: RUSS 304, or 307, or consent of the Department.

RUSS 454. *Russian Morphology and Syntax.* ★3 (either term, 3-0-0). Study of the morphological and syntactic system of Russian. Prerequisite: RUSS 453 or consent of the Department.

RUSS 462. *Russian Literature of the Late Nineteenth and Early Twentieth Centuries.* ★3 (Second Term, 3-0-0). The main trends in Russian literature of the late nineteenth and early twentieth centuries up to the revolutionary period. Prerequisite: Any one of RUSS 411, 412, 461, or consent of the Department. Note: Formerly part of RUSS 460.

RUSS 481. *Russian Literature After The Revolution.* ★3 (First Term, 3-0-0). Russian literature since 1917, with emphasis on the twenties and on the origin and development of Socialist realism. Prerequisite: RUSS 304, or 307, or consent of the Department. Note: Formerly part of RUSS 480.

RUSS 482. *Contemporary Soviet Russian Literature.* ★3 (Second Term, 3-0-0). A continuation of RUSS 481, this course will emphasize the thirties and the post-Stalinist period. Prerequisite: RUSS 481 or consent of the Department. Note: Formerly part of RUSS 480.

RUSS 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chairman for the procedure for student-initiated proposals.

44.36.3 HONORS AND GRADUATE COURSES

RUSS 500. *Reading Course.* ★6 (3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. Note: Not open to undergraduates.

RUSS 501. *Composition and Conversation I.* ★3 (First Term, 3-0-0).

RUSS 502. *Composition and Conversation II.* ★3 (Second Term, 3-0-0).

RUSS 503. *Russian Stylistics I.* ★3 (either term, 3-0-0).

RUSS 504. *Russian Stylistics II.* ★3 (either term, 3-0-0).

RUSS 511. *The Structure of Russian I: Syntax.* ★3 (First Term, 3-0-0). Note: Formerly S LIN 511.

RUSS 512. *The Structure of Russian II: Phonology.* ★3 (Second Term, 3-0-0). Note: Formerly S LIN 512.

RUSS 516. *Medieval Muscovite Literature.* ★3 (either term, 3-0-0). Russian literature from the fourteenth century to the end of the seventeenth. Note: Formerly RUSS 600.

RUSS 551. *Eighteenth Century Russian Literature and Culture.* ★3 (either term, 3-0-0). Russian literature during the century of Russia's Europeanization as seen against the background of philosophical, religious, aesthetic, and social problems.

RUSS 571. *History of Russian Criticism.* ★3 (First Term, 3-0-0). A detailed study of the history of Russian literary criticism, with emphasis on the nineteenth and twentieth centuries. Note: Formerly part of RUSS 530.

RUSS 641. *Studies in Russian Poetry.* ★3 (either term, 3-0-0).

RUSS 643. *Studies in Russian Realism.* ★3 (either term, 3-0-0).

RUSS 645. *Studies in Soviet Russian Literature.* ★3 (either term, 3-0-0).

RUSS 647. *Aspects of Modernism in Russian Literature.* ★3 (either term, 3-0-0). This course is designed to deal with the various aspects of the literary movements generally known as "Symbolism" and "Decadence".

RUSS 650. *Topics in Russian Literature.* ★3 (either term, 3-0-0).

RUSS 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

RUSS 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of a literary problem, period or genre not dealt with in the other Honors or graduate courses. Designed to meet the needs of individual Honors or Graduate students.

44.37 Scandinavian

Department of Germanic Languages

44.37.1 JUNIOR COURSE

SCAND 100. *Elementary Norwegian.* ★6 (3-0-2). Designed to give basic practical skill in everyday spoken and written Norwegian. The oral approach, using the laboratory is followed.

44.37.2 SENIOR COURSES

SCAND 300. *Second-Year Norwegian.* ★6 (3-0-1). Reading and study of selected texts in Norwegian literature and culture. Composition and conversation. Prerequisite: SCAND 100 or consent of the Department.

SCAND 340. *Medieval Scandinavian Literature in English.* ★6 (3-0-0). Selections in English from the Eddas and Sagas, followed by a brief survey of skaldic poetry and folk literature.

SCAND 351. *Modern Norwegian Literature in English.* ★3 (First Term, 3-0-0). The dramas of Ibsen and representative prose works (e.g., Hamsun, Undset). Note: Formerly part of SCAND 350.

SCAND 352. *Modern Danish and Swedish Literature in English.* ★3 (Second Term, 3-0-0). The dramas of Strindberg and representative prose works (e.g., Andersen, Jacobsen, and Lagerkviat). Note: Formerly part of SCAND 350.

SCAND 375. *Eighteenth and Nineteenth Century Scandinavian Literature.* ★6 (3-0-0). The development of Scandinavian Literature in the original from Holberg to the beginnings of Expressionism. Special emphasis in the second term on the dramas of Ibsen. Prerequisite: SCAND 300 or consent of the Department.

SCAND 380. *Modern Scandinavian Literature.* ★6 (3-0-0). Scandinavian literature in the original during the late nineteenth and twentieth centuries. Special emphasis on the plays of Strindberg. Prerequisite: SCAND 300 or consent of the Department.

SCAND 400. *Advanced Norwegian Grammar and Stylistics.* ★6 (3-0-0). Theoretical and applied study of complex areas of the Norwegian language, style, and idiomatic usage. Prerequisite: SCAND 300 or consent of the Department.

SCAND 498. *Special Topics in Scandinavian Languages and Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SCAND 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

44.37.3 HONORS AND GRADUATE COURSE

SCAND 550. *Old Icelandic Philology.* ★6 (3-0-0).

44.38 Slavics

44.38.1 SENIOR COURSES

SLAV 301. *Introduction to the Slavic Languages I.* ★3 (First Term, 3-0-0). The development of the Slavic languages against the background of early Slavic history and culture. The place of Slavic in the Indo-European language family. Prerequisites: POLSH 100, or RUSS 100, or 107, or UKR 100, or 107, or equivalent. Note: Formerly S LIN 301.

SLAV 302. *Introduction to the Slavic Languages II.* ★3 (Second Term, 3-0-0). A general outline of the basic features of the Slavic literary languages. Prerequisite: SLAV 301 or consent of the Department. Note: Formerly S LIN 302.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.) Accepted as an option only.

SLAV 403. *Introduction to Slavic Linguistics.* ★3 (First Term, 3-0-0). Investigation of general problems in the synchronic and diachronic study of the Slavic languages. Prerequisites: SLAV 302 and any one of POLSH 304, or RUSS 304, or 307, or UKR 304, or 307, or 332, or consent of the Department. Note: Formerly S LIN 403.

SLAV 405. *Contrastive Linguistics: Ukrainian-English.* ★3 (Second Term, 3-0-0). Contrastive study of the structures of Ukrainian and English with particular emphasis on problems of language learning. Prerequisite: SLAV 302, or 403, or consent of the Department. Note: Formerly UKR 455.

SLAV 407. *Contrastive Linguistics: Russian-English.* ★3 (Second Term, 3-0-0). Contrastive analysis of the phonological and syntactic systems of Russian and English with particular emphasis on problems of language learning. Prerequisite: SLAV 302, or 403, or consent of the Department. Note: Formerly RUSS 455.

SLAV 420. *Old Church Slavonic I.* ★3 (First Term, 3-0-0). An introduction to the grammar of the oldest Slavic texts, with selected readings. Prerequisites: SLAV 302, and RUSS 304, or UKR 304, or 332, or consent of the Department. Note: Formerly part of SLAV 520.

SLAV 421. *Old Church Slavonic II.* ★3 (Second Term, 3-0-0). A continuation of SLAV 420. Prerequisite: SLAV 420. Note: Formerly part of SLAV 520.

SLAV 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chairman for the procedure for student-initiated proposals.

44.38.2 HONORS AND GRADUATE COURSES

SLAV 501. *An Introduction to Research in Slavic Literatures and Linguistics.* ★2 (First Term, 2-0-0). Note: Formerly RUSS 505.

SLAV 515. *Old East Slavic Literature.* ★3 (either term, 3-0-0). Survey of Old East Slavic literature up to the fourteenth century, with emphasis on literary documents from Kiev and Novgorod. Note: Formerly RUSS 600.

SLAV 518. *Comparative Slavic Linguistics.* ★3 (Second Term, 3-0-0). Methods of comparative linguistics as applied to the Slavic languages. Note: Formerly S LIN 404.

SLAV 522. *Historical Grammar of East Slavic.* ★3 (Second Term, 3-0-0). Detailed discussion of some specific problems in the historical development of Russian, Ukrainian, and Byelorussian. Note: Formerly S LIN 522.

SLAV 541. *Slavic Syntax.* ★3 (either term, 3-0-0). Note: Formerly S LIN 541.

SLAV 542. *Slavic Phonology.* ★3 (either term, 3-0-0). Note: Formerly S LIN 542.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.) Required for the M.A. in East European and Soviet Studies; otherwise accepted as an option only.

SLAV 561. *History of the West Slavic Languages.* ★3 (either term, 3-0-0). Note: Formerly S LIN 621.

SLAV 562. *History of the South Slavic Languages.* ★3 (either term, 3-0-0). Note: Formerly S LIN 622.

SLAV 650. *Topics in Slavic Linguistics.* ★3 (either term, 3-0-0).

SLAV 696. *Readings in Old Slavic Texts.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SLAV 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). This course is designed to meet the needs of individual Honors and Graduate students in Slavic languages and literatures. The course will normally deal with a Slavic language or national literature not offered in the other Honors and Graduate courses.

44.39 Sociology

44.39.1 JUNIOR COURSE

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

44.39.2 SENIOR COURSES

SOC 301. *Sociology of Sex Roles.* ★3 (either term, 3-0-0). Comparative study of sex roles in selected societies with an emphasis upon contemporary Canada; sex-specific role behaviors and theories regarding their origin; recent sociological research on the social effects of sex roles.

SOC 311. *Statistics and Social Research.* ★6 (3-0-2). Research design, data collection, and data processing in the social sciences. Logic and interpretation of statistical concepts and methods, measures of central tendency, variability and relationships; sampling and tests of hypotheses. Techniques of social measurement, experimental design, and introduction to scaling.

SOC 313. *Introduction to Statistics.* ★3 (either term, 3-0-1). Introduction to the sociological application of statistics. The logic and interpretation of statistical concepts; measures of central tendency; variability and relationships; sampling and tests of hypotheses. Note: SOC 311 and SOC 313 may not both be taken for credit.

SOC 321. *Sociology of Social Problems.* ★3 (either term, 3-0-0). A review of several macro-sociological perspectives focusing on such topics as population, ecology, social and economic inequality, intergroup relations, nationalism, collective violence and the sociology of social intervention. Note: Not available for credit to students with credit in SOC 320, or 324.

SOC 322. *Canadian Social Issues.* ★3 (either term, 3-0-0). Issues in such institutional areas as economy, authority, social class, collective values and education; programs of selected regional, ethnic, and national interest groups; implications for other segments of Canadian society.

SOC 323. *Sociology of Poverty.* ★3 (either term, 3-0-0). The origins, meaning and effects of poverty, with special emphasis on Canada; theoretical perspectives on poverty; examination of poverty from various institutional perspectives such as education, health, law and housing; evaluation of poverty programs.

SOC 324. *Sociology of Deviance and Conformity.* ★3 (either term, 3-0-0). Processes involved in defining behavior patterns as deviant; factors which influence conformity and change; examination of such behavior patterns as sexuality, alcoholism, drug use, and selected mental and physical disabilities; public reaction to such behavior. Note: Not available for credit to students with credit in SOC 320 or 321.

SOC 325. *Criminology.* ★3 (either term, 3-0-0). Examination and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior.

SOC 327. *Criminal Justice Administration.* ★3 (either term, 3-0-0). The evolution and evaluation of the theories of punishment; the law, the police and the courts; penal and reformatory institutions; probation and parole; experiments in reform and rehabilitation. Prerequisite: SOC 325.

SOC 332. *The Development of Sociology I.* ★3 (either term, 3-0-0). A survey of the origin and the development of classical sociological theory, with particular emphasis on Comte, Spencer, Marx, Durkheim and Toennies. Prerequisite: SOC 202 or 403.

SOC 333. *The Development of Sociology II.* ★3 (either term, 3-0-0). A survey of the contributions of modern and contemporary sociological theorists, particularly Weber, Pareto, Parsons, Mead, and others. Prerequisite: SOC 332.

SOC 341. *Social Psychology.* ★3 (either term, 3-0-1). An introduction to the study of individual and group behavior observed in social processes. Prerequisites: SOC 202, or 403, or PSYCO 260/261, or EDPSY 269/271. Note: SOC 341 and PSYCO 341 may *not* both be taken for credit.

SOC 342. *Socialization.* ★3 (either term, 3-0-0). Socio-cultural influences on the development of the self, from infancy through old age. Prerequisite: SOC 341.

SOC 343. *Collective Behavior.* ★3 (either term, 3-0-0). Analysis of various forms of collective behavior, including crowds, mobs, social movements, and fugitive behavior patterns. Prerequisite: SOC 202, or 403, or 341, or PSYCO 341.

SOC 344. *Public Opinion and Mass Communication.* ★3 (either term, 3-0-0). Factors involved in the formulation and assessment of public opinion; the role of the media in mass communication. Emphasis on Canadian society. Prerequisite: SOC 202, or 403, or 341, or PSYCO 341.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). (See § 44.22.) Accepted as an option only.

SOC 351. *Population Concerns.* ★3 (either term, 3-0-0). Population trends and problems in Canada and the rest of the world; social and cultural factors underlying fertility, mortality, and migration patterns and differentials; their relationship to the "population explosion," population composition and distribution; basic population methodology; ecological theories and processes; urbanization; population theory and policy.

SOC 352. *Population, Social and Economic Development.* ★3 (either term, 3-0-0). Principles of growth and development in their historical context with regard to developed countries, such as Canada, and in their contemporary context with regard to underdeveloped countries. The interrelationships of economic, social and demographic variables in the process of development. Problems of urbanization and industrialization; factors influencing social change in the modern West or Asia or Latin America or Africa.

SOC 353. *Urban Sociology.* ★3 (either term, 3-0-0). Social implications of urban life with respect to such topics as patterns of city growth; urban social organization (family, neighbourhood, community); urban social issues (housing, crime); urban policy and urban planning (sociology of planning, citizen participation). Prerequisite: SOC 202, or 403, or consent of the Department.

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 361. *Social Organization.* ★3 (either term, 3-0-0). Social systems, their components, interrelations, and the bases of social differentiation and integration. Prerequisite: SOC 202 or 403.

SOC 362. *Comparative Societies.* ★3 (either term, 3-0-0). An introduction to comparative sociology with attention to theoretical and methodological issues, and substantive problems in various kinds of societies. Prerequisite: SOC 202, or 403, or consent of the Department.

SOC 363. *Industrial Sociology.* ★3 (either term, 3-0-0). An introduction to the systematic analysis of people at work. Of special interest are the impacts of industrialization on Canadian and other developed societies as well as the intergroup and

interpersonal relations in work settings. Prerequisite: SOC 202 or 403.

SOC 364. *Comparative Institutional Change.* ★3 (either term, 3-0-0). Interrelationships among social institutions (technology, economy class, kinship, power structures, basic value patterns); comparative institutional structures and changes in Canada and other selected societies. Prerequisite: SOC 202, or 403, or consent of the Department.

SOC 367. *Values and Belief Systems.* ★3 (either term, 3-0-0). The origins, developments, and social consequences of systems of beliefs and values. Prerequisite: SOC 202 or 403.

SOC 368. *Canadian Ethnic and Minority Relations.* ★3 (either term, 3-0-0). Analysis of social processes leading to the development and understanding of minority status: case studies of ethnic and minority-group relations, with reference to cross-national studies. Prerequisite: SOC 202 or 403.

SOC 371. *The Family.* ★3 (either term, 3-0-0). Structure and function of the family system, historically and cross-culturally. The family system in contemporary societies emphasizing its institutional characteristics and current trends. Prerequisite: SOC 202 or 403.

SOC 373. *Social Psychology of Health and Illness.* ★3 (either term, 3-0-0). Social psychological factors in health and illness and medical care, including attitudes, beliefs, roles, socialization, and interpersonal processes. Prerequisite: SOC 202 or 403.

SOC 374. *Social Organization of Health Care.* ★3 (either term, 3-0-0). The social structure and dynamics of health care organization, including hospitals, professional-bureaucratic relations in health care organizations, professional socialization, and governmental functions. Prerequisite: SOC 202 or 403.

SOC 375. *Sociology of Aging.* ★3 (either term, 3-0-0). Aging as a socio-cultural phenomenon. Includes aging in relation to the self-concept, family, religion, politics, health, retirement and leisure, housing, attitudes toward death, with particular emphasis on North American society.

SOC 376. *Sociology of Religion.* ★3 (either term, 3-0-0). Religion as a social phenomenon; theories of religious behavior; religious authority and leadership; the individual's religion and the interplay with other spheres of social life; the role of religion in relation to social change and social integration. Prerequisite: SOC 202 or 403.

SOC 377. *Sociology of Youth.* ★3 (either term, 3-0-0). The comparative analysis of youth in various types of societies, with special emphasis on Canada including investigation of social structures and processes influencing behavior of young people.

INT D 393. *Political Sociology.* ★3 (either term, 3-0-0). (See § 44.22).

SOC 400. *Honors Seminar.* ★3 (either term, 0-2s-0).

SOC 403. *Principles of Sociology.* ★3 (either term, 3-0-0). Basic concepts and principles of Sociology for students with advanced standing. Prerequisite: Senior or graduate standing. Note: May not be taken for credit by students with credit in SOC 202.

SOC 404. *Conference Course in Sociology for Honors Students.* ★3 (First Term, 0-2s-0).

SOC 405. *Conference Course in Sociology for Honors Students.* ★3 (Second Term, 0-2s-0).

SOC 409. *Honors Essay.* ★6 (3-0-0).

SOC 411. *Introduction to Multivariate Sociological Analysis.* ★3 (First Term, 3-0-0). Introduction to the use of multivariate tabular analysis, multiple correlation and regression and analysis of variance in sociology. Prerequisite: SOC 311. Note: Formerly SOC 412.

SOC 412. *Methodological Problems in Social Research.* ★3 (Second Term, 3-0-0). The design and evaluation of qualitative and quantitative research strategies in the social sciences. Prerequisite: SOC 311. Note: Formerly SOC 411.

SOC 413. *Data Operations in Sociology.* ★3 (either term, 3-0-0). The application of data manipulation equipment and the nature of data processing in sociological inquiry. Prerequisite: SOC 311 or 313.

SOC 424. *Social Structure and Crime.* ★3 (either term, 3-0-0). The effects of urbanization, industrialization, social change, and ecological factors on crime and deviance, with particular emphasis on comparative research. Prerequisite: SOC 325.

SOC 425. *Research Problems in Criminology.* ★3 (either term, 3-0-0). Data access, collection, interpretation and dissemination; goal definition, evaluation, and consequences of social action research. Prerequisite: SOC 311 and 325.

SOC 426. *Criminal Control.* ★3 (either term, 3-0-0). Study of proposals advanced to control criminal behavior; the interrelationship of the social sciences with the law, law enforcement and welfare agencies. Prerequisite: SOC 325.

SOC 427. *Juvenile Delinquency.* ★3 (either term, 3-0-0). Juvenile delinquency and its relation to adult crime; the social processes involved in the genesis and perceptions of styles of delinquency and their relationship to the community, and to various current theories of prevention and control, including the role of institutions and law. Prerequisite: SOC 325. Note: Not open to students with credit in SOC 329.

SOC 428. *Criminal Careers.* ★3 (Second Term, 3-0-0). Analysis of types of criminal behavior through the use of individual and limited case methods; social processes involved in the genesis and styles of crime as they apply to the involvement of the particular criminal and victim. Prerequisite: SOC 325.

SOC 429. *Sociology of Law.* ★3 (either term, 3-0-0). Conceptual and practical points of convergence between legal and social theory; processes by which legal rules are created, maintained and changed; law as an instrument of social control and change. Prerequisite: SOC 325.

SOC 434. *Contemporary Sociological Theory.* ★3 (either term, 3-0-0). Current developments in sociological theory: concepts, recent contributions, and theoretical issues and controversies. Prerequisite: SOC 333 or consent of the Department.

SOC 437. *The Sociology of Knowledge.* ★3 (either term, 3-0-0). Study of the hypothesis that the forms of social life condition knowledge. Analysis of the versions of this thesis offered by such scholars as: Vico, Marx-Engles, Nietzsche, Scheler, Pareto, Durkheim, Mannheim, and more recent writers. Assessment of their proposed solutions to the social limitations imposed on knowing.

SOC 440. *Theories in Social Psychology.* ★3 (either term, 3-0-0). Current theories and related research in social psychology. Prerequisite: SOC 341 or PSYCO 341.

SOC 442. *Reinforcement and Social Behavior.* ★3 (either term, 3-0-1). Operant principles applied to the fundamental processes of social behavior. An examination of critical studies utilizing a reinforcement perspective. Prerequisite: SOC 341 or PSYCO 341.

SOC 443. *Ethnomethodology.* ★3 (either term, 3-0-0). Major focus; methods whereby members of society make sense of their social world; analysis of invariant features of such methods. Versions of social reality as manifested in conversation. Major forerunners; Plato, Husserl, Wittgenstein, Merleau-Ponty, G. H. Mead, Blumer, Schultz. Current major exponents: Garfinkel, Sacks, Cicourel, E. Rose. Prerequisite: SOC 202, or 403, or consent of the Department.

SOC 447. *Leadership.* ★3 (either term, 3-0-0). Group interaction and the differentiation of leaders; various social systems. Prerequisite: SOC 341 or 361 or PSYCO 341.

SOC 450. *Techniques of Demographic Analysis.* ★3 (either term, 3-0-0). Conventional techniques of population analysis as applied to census and vital statistics. Prerequisite: SOC 351.

SOC 451. *Fertility and Family Planning.* ★3 (either term, 3-0-0). Emphasis on the social, social-psychological, and cultural correlates of fertility; fertility prediction and control. Prerequisite: SOC 351, or 352, or consent of the Department.

SOC 453. *The Urban Community.* ★3 (either term, 3-0-0). An examination of the urban community in Canada and other countries from the ecological, social psychological, and social organizational perspectives. Appraisal of community studies. Introduction to community research priorities and methodologies. Prerequisite: SOC 202, or 403, or consent of the Department.

INT D 455. *Migration.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 456. *Mortality, Morbidity, and Aging.* ★3 (either term, 3-0-0). Measures and determinants of mortality and morbidity; social gerontology in Canada and other developed and developing societies; demographic and selected socio-economic aspects of aging. Prerequisites: SOC 351, or 352, or 375, or consent of the Department.

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 457. *Sociology and the Future of Urban Canada.* ★3 (either term, 3-0-0). Alternatives to and implications of present city forms, housing, and land development policies from a socio-

logical perspective, including new towns, urban redevelopment, suburbia. Prerequisite: SOC 353 or consent of the Department.

SOC 458. *Sociology of Housing in Canada.* ★3 (either term, 3-0-0). Social and cultural bases *for* (and *impact* of) housing forms, design types, site plans and housing needs of special groups; housing trends in Canada and other countries. Prerequisite: SOC 353 or consent of the Department.

INT D 458. *Agrarian Social Movements.* ★3 (First Term, 3-0-0). (See § 44.22.)

SOC 459. *The Demography of Marriage and Family.* ★3 (either term, 3-0-1). Review and analysis of the demographic interrelationships of fertility, mortality, and migration with marriage and the family; a cross-cultural review of historical trends, contemporary patterns and future implications; emphasis on statistical measurement, family planning and policy in the Canadian setting. Prerequisite: SOC 371. Note: Formerly SOC 357.

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 460. *Social Organization — Organizational Theory.* ★3 (either term, 3-0-0). Models of social organization; the units of social structure; the bases of social integration, social control, and social change. Prerequisite: SOC 361.

SOC 461. *Sociology of Art.* ★3 (either term, 3-0-0). A sociological study of art forms including painting, literature, music, and architecture; cross-cultural analysis of the roles of the artist; the relationship of art forms and movements to different social conditions and social change. Prerequisite: SOC 202 or 403.

SOC 462. *Science and Society.* ★3 (either term, 3-0-0). Factors in the development of the cognitive and organizational domain of science; interrelations between science and major societal institutions and culture; the future of science and the future of society. Prerequisite: SOC 202 or 403.

SOC 463. *Sociology of Professions.* ★3 (either term, 3-0-0). The process of professionalization, including the development of professional ethics, ideologies, and associations. The role of bureaucracy in professionalization and professional career patterns. Prerequisite: SOC 202 or 403.

SOC 464. *Advanced Industrial Sociology.* ★3 (either term, 3-0-0). The study of participative structures, such as industrial democracy, in work settings and an examination of current topics related to the quality of working life. Prerequisite: SOC 363.

SOC 465. *Sociology of Complex Organizations.* ★3 (either term, 3-0-0). Approaches to formal organization and management; division of labor and its organizational implications, deviance and conflict within organization, problem solving, and organizational authority. Prerequisite: SOC 361.

SOC 467. *Social Class in Modern Society.* ★3 (either term, 3-0-0). Social stratification in Western society, with reference to the effects of industrialization; comparative analysis of primitive societies. Special attention given to the basis of stratification, the structure and function of social class systems, social mobility, and the special classes in modern society, such as the "managerial class", labor, and "power elite". Prerequisite: SOC 202 or 403.

SOC 468. *Theories of Ethnic and Minority-Group Relations.* ★3 (either term, 3-0-0). Theoretical analysis of historical, comparative, and social psychological aspects of minority-majority group relationships. Prerequisite: SOC 368.

SOC 469. *Sociology of Work and Leisure.* ★3 (either term, 3-0-0). The nature, meaning, and functions of work in historical and cross-cultural context; sociological analysis of work and leisure; changing uses and meaning of leisure time. Prerequisite: SOC 202 or 403.

SOC 471. *Comparative Family Systems.* ★3 (either term, 3-0-0). Institutional analysis of similarities and differences in family systems in a variety of contemporary complex societies. Prerequisite: SOC 202, or 403, and 371.

SOC 472. *Canadian Society.* ★3 (either term, 3-0-0). The composition of the Canadian population; the value hierarchy, the nature and relationships of the major institutions, and the structure of Canadian society. Prerequisite: SOC 202 or 403.

SOC 473. *Sociology of Death and Dying.* ★3 (either term, 3-0-0). Comparative examination of death and dying in socio-cultural contexts, including theoretical and methodological issues. Prerequisite: SOC 341, or 361, or 375.

SOC 474. *Sociology of Mental Illness.* ★3 (either term, 3-0-0). Sociological aspects of mental health and illness. Includes historical perspectives, diagnostic issues, social epidemiology, and perspectives on causation and treatment.

SOC 475. *Advanced Sociology of Aging.* ★3 (either term, 3-0-0). In-depth examination of selected theoretical approaches, methodological issues, and topics of substantive concern in the study of aging and the aged. Prerequisite: SOC 375.

INT D 475. *The Family in Socio-Historical Perspective.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 476. *Religion and Societies.* ★3 (either term, 3-0-0). A comparative survey of the major world religions in interaction with the socio-economic and political structures of various societies. Prerequisite: SOC 376.

SOC 477. *Social Psychology of Marriage.* ★3 (either term, 3-0-0). Social psychological analysis of marital power and authority, sexual interaction, and marital cohesion and stability. Emphasis on theoretical issues in marital interaction over the life cycle. Prerequisite: SOC 341, and SOC 371, or FAM 241 (Home Economics students).

SOC 478. *Family Structure and Interaction.* ★3 (either term, 3-0-0). Social psychological analysis of parenthood, socialization processes and family interaction over the life cycle. Relationship between family structure and the organization and sequence of perception and behavior is emphasized. Prerequisite: SOC 341 and 371. Note: Formerly SOC 470.

SOC 480. *Theories of Social Change.* ★3 (either term, 3-0-0). Significance of change in social and cultural systems; problems of induced change in selected cultures. Prerequisite: SOC 202 or 403.

SOC 481. *Canadian Social Area Studies.* ★3 (either term, 3-0-0). To be taught from time to time with different selected emphases on one or another of Canada's social areas (e.g., Quebec Society, Maritime Society, Prairie Society, Social Change in Northern Canada, etc.). Prerequisite: SOC 361.

SOC 490. *Sociology and Public Policy.* ★3 (either term, 3-0-0). Past and present relationship among sociology, social research and social needs, including the impact of sociological research on public policy formation, program development and implementation and program assessment. Prerequisites: Four half-year courses in Sociology.

44.39.3 HONORS AND GRADUATE COURSES

SOC 503. *Conference Course in Sociology for Graduate Students.* ★3 (First Term, 3-0-0).

SOC 504. *Conference Course in Sociology for Graduate Students.* ★3 (Second Term, 3-0-0).

SOC 511. *Multivariate Analysis.* ★3 (First Term, 3-0-0). Note: Offered in alternate years with SOC 512. Prerequisite: SOC 311.

SOC 512. *Advanced Methods of Sociological Inquiry.* ★3 (Second Term, 3-0-0). Note: Offered in alternate years with SOC 511. Prerequisite: SOC 311.

SOC 514. *Evaluation Research.* ★3 (either term, 3-0-0). The application of research methods and procedures to the evaluation of social policies and social programs; methodological, political, and social issues; case studies. Prerequisite: SOC 411.

SOC 519. *Selected Topics in Research.* ★3 (either term 0-3s-0).

SOC 521. *Seminar in Theories of Deviance.* ★3 (First Term 0-3s-0).

SOC 522. *Selected Topics in Deviance and Social Control.* ★3 (Second Term, 3-0-0).

SOC 523. *Criminal Justice in the Community.* ★2 (1-0-0) Presentations by persons actively involved in the criminal justice system. Restricted to M.A. (Corrections) students. Prerequisite: Consent of the Department.

SOC 524. *Field Placement in Criminal Justice.* ★3 (either term 3-0-0). Restricted to M.A. (Corrections) students. Prerequisite: Consent of the Department.

SOC 525. *Seminar in Criminal Justice Administration.* ★3 (either term, 0-3s-0).

SOC 526. *Seminar in Criminological Theory.* ★3 (either term 0-3s-0).

SOC 527. *Seminar in Correctional Theory.* ★3 (either term 0-3s-0).

SOC 531. *Seminar in the History of Sociological Thought.* ★3 (either term, 0-3s-0).

SOC 532. *Seminar in Theory Construction.* ★3 (either term, 0-3s-0).

SOC 533. *Logic of Sociological Inquiry.* ★3 (either term, 3-0-0).

SOC 534. *Contemporary Sociological Concepts.* ★3 (either term, 3-0-0).

SOC 537. *Seminar in the Sociology of Knowledge.* ★3 (either term, 0-3s-0).

SOC 541. *Seminar in Symbolic Behavior.* ★3 (either term, 0-3s-0).

SOC 542. *Small Group Behavior.* ★3 (either term, 3-0-2).

SOC 543. *Seminar in Mass Phenomena.* ★3 (either term, 0-3s-0).

SOC 544. *Seminar in Socialization Processes.* ★3 (either term, 0-3s-0).

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). (See § 44.22.) Accepted as an option only.

SOC 550. *Historical Demography.* ★3 (either term, 3-0-0).

SOC 551. *Seminar in Demography.* ★3 (either term, 0-3s-0).

SOC 553. *Seminar in Urban Society.* ★3 (either term, 0-3s-0).

SOC 555. *Human Ecology.* ★3 (either term, 3-0-0).

SOC 556. *Selected Topics in Environmental Sociology.* ★3 (either term, 3-0-0).

SOC 561. *Seminar in Social Organization.* ★3 (either term, 0-3s-0).

SOC 562. *Seminar in Social Class.* ★3 (either term, 0-3s-0).

SOC 565. *Seminar in Work.* ★3 (either term, 0-3s-0).

SOC 566. *Seminar in Formal and Complex Organization.* ★3 (either term, 0-3s-0).

SOC 568. *Seminar in Ethnic and Minority Relations.* ★3 (either term, 0-3s-0).

SOC 570. *Seminar in Family Theory.* ★3 (either term, 0-3s-0).

SOC 571. *Seminar in Issues and Techniques in Family Theory Construction.* ★3 (either term, 0-3s-0).

SOC 572. *Selected Topics in Canadian Society.* ★3 (either term, 0-3s-0).

SOC 573. *Advanced Social Psychology of Health and Illness.* ★3 (either term, 3-0-0).

SOC 574. *Advanced Social Organization of Health Care.* ★3 (either term, 3-0-0).

SOC 575. *Seminar in Aging and Age Differentiation.* ★3 (either term, 0-3s-0).

SOC 576. *Seminar in Sociology of Religion.* ★3 (either term, 0-3s-0).

SOC 577. *Seminar in Sex Stratification and Sex Differentiation.* ★3 (either term, 0-3s-0).

SOC 578. *Seminar in Marital and Family Interaction.* ★3 (either term, 0-3s-0).

SOC 580. *Seminar in Sociology of Modernization.* ★3 (either term, 0-3s-0).

SOC 593. *Seminar in Political Sociology.* ★3 (either term, 0-3s-0).

SOC 603. *Conference Course.* ★3 (First Term, 3-0-0).

SOC 604. *Conference Course.* ★3 (Second Term, 3-0-0).

SOC 605. *Seminar in Teaching and Professional Skills.* ★3 (either term, 0-3s-0).

SOC 611. *Selected Topics in Social Statistics.* ★3 (either term, 0-3s-0). Note: Offered in alternate years with SOC 612.

SOC 612. *Selected Topics in Sociological Research Methods.* ★3 (either term, 0-3s-0).

SOC 631. *Seminar in Advanced Sociological Theory.* ★3 (either term, 0-3s-0).

SOC 633. *Mathematical Sociology.* ★3 (either term, 0-3s-0).

SOC 641. *Selected Topics in Social Psychology.* ★3 (either term, 0-3s-0).

SOC 642. *Experimental Small Group Research.* ★3 (either term, 0-3s-0).

SOC 652. *Seminar in Population, Social and Economic Development.* ★3 (either term, 0-3s-0).

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). (See § 44.22.)

SOC 661. *Seminar in the Sociological Profession.* ★2 (0-1s-0).

SOC 670. *Seminar in Advanced Topics in Family Theory and Research.* ★3 (either term, 0-3s-0).

SOC 673. *Seminars in Medical Sociology I.* ★3 (either term, 0-3s-0).

SOC 674. *Seminars in Medical Sociology II.* ★3 (either term, 0-3s-0).

SOC 675. *Seminars in Medical Sociology III.* ★3 (either term, 0-3s-0).

SOC 900. *Non-Thesis Project.* ★3 (variable). Prerequisite: Consent of the Department. Note: For Graduate students in the Sociology Non-Thesis M.A. program.

NOTE: FOR COURSES IN SPANISH LANGUAGE AND LITERATURES, SEE § 44.20 *HISPANIC LANGUAGES AND LITERATURES.*

NOTE FOR COURSE IN SOVIET STUDIES, SEE § 44.12 *EAST EUROPEAN AND SOVIET STUDIES.*

44.40 Ukrainian

Department of Slavic Languages

44.40.1 JUNIOR COURSES

UKR 100. *Beginners' Ukrainian.* ★6 (3-0-2). Essentials of grammar, reading, and drill on useful expressions. Designed to give a working knowledge of the Ukrainian language. Note: Not open to students with credit in Ukrainian 30.

UKR 106. *Intensive Beginners' Ukrainian I.* ★3 (25-0-5). An 'immersion' course designed to give a working knowledge of Ukrainian, with emphasis on conversational skills. Note: This course is given during the Summer Session only.

UKR 107. *Intensive Beginners' Ukrainian II.* ★3 (25-0-5). The continuation of UKR 106. Prerequisite: UKR 106 or consent of the Department. Note: This is a Summer Session course given in the Soviet Union.

UKR 200. *First-Year University Ukrainian.* ★6 (3-0-1). A brief review of phonology, an intensive study of grammar. Readings of selected texts from modern Ukrainian literature, and elementary composition supplemented by laboratory work in conversational Ukrainian. Designed for students having some previous knowledge of Ukrainian. Prerequisite: Ukrainian 30 or the consent of the Department.

44.40.2 SENIOR COURSES

UKR 303. *Second Year Ukrainian I.* ★3 (First Term, 3-0-0). Advanced Ukrainian grammar, composition, and oral practice based on selected texts of Ukrainian classical and contemporary literature. Prerequisite: UKR 100, or 107, or consent of the Department. Note: Formerly part of UKR 300.

UKR 304. *Second-Year Ukrainian II.* ★3 (Second Term, 3-0-0). This course is a continuation of UKR 303, with greater emphasis on reading and composition. Prerequisite: UKR 303 or consent of the Department. Note: Formerly part of UKR 300.

UKR 305. *Second Year Practical Study.* ★3 (0-0-2). Development of oral skills. Recommended for students taking UKR 303 and 304.

UKR 306. *Intensive Second-Year Ukrainian I.* ★3 (25-0-5). An 'immersion' course in second-year Ukrainian, with emphasis on conversational skills. Prerequisite: UKR 100, or 107, or consent of the Department. Note: This course is given during the Summer Session only.

UKR 307. *Intensive Second-Year Ukrainian II.* ★3 (25-0-5). The continuation of UKR 306. Prerequisite: UKR 306 or consent of the Department. Note: This is a Summer Session course given in the Soviet Union.

UKR 311. *Standard Scholarly and Technical Ukrainian I.* ★3 (First Term, 3-0-0). An introduction to technical Ukrainian writing stressing idiomatic usage in a variety of areas outside of belles-lettres proper (e.g. anthropology, history, geography). Prerequisite UKR 200, or 304, or consent of the Department.

UKR 312. *Standard Scholarly and Technical Ukrainian II.* ★3 (Second Term, 3-0-0). This course is designed as a continuation of UKR 311; the student will be introduced to other areas of Ukrainian writing (e.g. art, music, physical education). Prerequisite: UKR 311 or consent of the Department.

UKR 320. *Masterpieces of Ukrainian Literature (in Translation).* ★3 (either term, 3-0-0). A survey of the outstanding authors and literary trends in nineteenth and twentieth century Ukrainian literature against their social and historical backgrounds. Note: Not accepted to meet the requirements in the principal area of concentration, or the second area of concentration, if the principal area is Ukrainian.

UKR 326. *Ukrainian Culture.* ★6 (3-0-0). A survey of Ukrainian culture and civilization stressing major developments in litera-

ture and fine arts. Note: Not accepted to meet concentration requirements in Ukrainian, if the principal subject of concentration is Ukrainian.

UKR 361. *Advanced Ukrainian I.* ★3 (First Term, 3-0-0). Review of difficult grammatical points with special emphasis on syntax and stylistics; reading of selected texts from Ukrainian classical and contemporary literature. Prerequisite: UKR 200, or 304, or 307, or consent of the Department. Note: Formerly part of UKR 331 and 401.

UKR 362. *Advanced Ukrainian II.* ★3 (Second Term, 3-0-0). This course is a continuation of UKR 361 with emphasis on composition and analysis of literary texts. Prerequisite: UKR 361 or consent of the Department.

UKR 405. *Third-Year Practical Study.* ★3 (0-0-2). Development of oral skills. Recommended for students taking UKR 361 and 362.

UKR 411. *Ukrainian Literature to 1880.* ★3 (First Term, 3-0-0). A survey course covering the main authors and literary trends from the beginnings of Ukrainian literature up to and including Panas Myrnyj. Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly part of UKR 360.

UKR 412. *Ukrainian Literature from 1880 to the 1920's.* ★3 (Second Term, 3-0-0). A continuation of UKR 411, this course will cover Ukrainian literature after 1880, with emphasis on modernism. Prerequsite: UKR 411 or consent of the Department. Note: Formerly part of UKR 360.

UKR 422. *Introduction to Ukrainian Folklore I.* ★3 (First Term, 3-0-0). A survey of the folk song genres, with analysis of texts in the original. Prerequisites: A senior course in Ukrainian and consent of the Department.

UKR 423. *Introduction to Ukrainian Folklore II.* ★3. (Second Term, 3-0-0). A continuation of UKR 422. This course will also deal with the prose and minor verbal genres. Prerequisite: UKR 422.

UKR 451. *Cultural History of the Ukrainian Language.* ★3 (either term, 3-0-0). The growth and the development of the Ukrainian language from its origins to the present day. Prerequisite: UKR 304, or 307, or 312, or consent of the Department.

UKR 453. *Ukrainian Phonetics.* ★3 (either term, 3-0-0). Scientific study of the Ukrainian sound system combined with practice in phonetic discrimination and transcription. Prerequisite: UKR 304, or 307, or 312, or consent of the Department.

UKR 454. *Ukrainian Morphology and Syntax.* ★3 (either term, 3-0-0). Study of the morphological and syntactic systems of Ukrainian. Prerequisite: UKR 453 or consent of the Department.

UKR 465. *Shevchenko.* ★3 (either term, 3-0-0). Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly UKR 612.

UKR 466. *Ukrainka.* ★3 (either term, 3-0-0). Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly UKR 614.

UKR 467. *Franko.* ★3 (either term, 3-0-0). Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly UKR 616.

UKR 481. *Soviet Ukrainian Literature.* ★3 (First Term, 3-0-0). Detailed study of the major Soviet Ukrainian writers with emphasis on neoclassicism and Socialist realism. Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly part of UKR 630.

UKR 482. *Ukrainian Emigré Literature.* ★3 (Second Term, 3-0-0). Detailed study of Ukrainian emigré writers. Prerequisite: UKR 304, or 307, or 312, or consent of the Department. Note: Formerly part of UKR 630.

UKR 499. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Students as well as staff may initiate proposals in any given year for the content of this course. Please consult the Department Chairman for the procedure for student-initiated proposals.

44.40.3 HONORS AND GRADUATE COURSES

UKR 503. *Ukrainian Stylistics.* ★3 (either term, 3-0-0).

UKR 504. *Problems in English-Ukrainian Translation.* ★3 (either term, 3-0-0).

UKR 511. *The Structure of Ukrainian.* ★3 (First Term, 3-0-0).

UKR 516. *Medieval Ukrainian Literature.* ★3 (either term, 3-0-0). Study of the major sources and trends in Ukrainian literature from the fourteenth to the seventeenth centuries. Note: Formerly UKR 610.

UKR 517. *Ukrainian Dialectology.* ★3 (either term, 3-0-0).

UKR 531. *History of Ukrainian Folklore Studies.* ★3 (either term, 3-0-0).

UKR 532. *Ukrainian Folklore in Canada.* ★3 (either term, 3-0-0).

UKR 631. *Topics in Ukrainian Folklore.* ★3 (either term, 3-0-0).

UKR 641. *Studies in Ukrainian Poetry.* ★3 (either term, 3-0-0).

UKR 642. *Studies in Ukrainian Drama.* ★3 (either term, 3-0-0).

UKR 643. *Studies in the Soviet Ukrainian Novel.* ★3 (either term, 3-0-0).

UKR 650. *Topics in Ukrainian Literature.* ★3 (either term, 3-0-0).

UKR 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

UKR 699. *Conference Course.* ★3 (either term, 3-0-0). A detailed study of a literary problem, period, or genre not dealt with in the other Honors or Graduate courses. Designed to meet the needs of individual Honors or Graduate students.

Faculty of Business Administration and Commerce

51 INTRODUCTORY

51.1 Members of the Faculty

51.1.1 STAFF

Dean
R. S. SMITH, Ph.D.

Associate Dean (Graduate Programs)
R. E. SCHNECK, Ph.D.

Associate Dean (Undergraduate Programs)
M. J. VERTIGAN, Ph.D.

Faculty Service Officer
B. C. COHOON, M.B.A.,

Administrative Officer
M. R. NICKOLCHUK, B.Ed.

DEPARTMENT OF ACCOUNTING

Professor and Chairman
K. W. LEMKE, M.Comm., AASA, AAUQ

Winspear Higgins Professor
R. R. STERLING, Ph.D.

Associate Professors
D. M. BAKER, Ph.D.
R. A. DENHAM, Ph.D., C.A.
D. GOODALE, Ph.D., C.A., R.I.A.
P. R. GRAUL, Ph.D., C.P.A.
H. A. KENNEDY, Ph.D., C.A.
J. D. NEWTON, Ph.D.
P. TIESSEN, Ph.D.
J. H. WATERHOUSE, Ph.D.
J. J. WILLIAMS, Ph.D., R.I.A.

Visiting Associate Professors
W. D. J. COTTON, M.Comm., A.C.A., C.M.A.
R. LEONG, M.B.A., C.A., R.I.A.

Lecturers
T. CLARKE, M.B.A.
D. DOWELL, M.B.A.
R. T. DUE, M.Sc.
W. J. FOWLIS, B.Com., C.A.
M. GIBSON, B.Com., C.A.
S. GLOVER, B.Math., C.A., R.I.A.
B. HESJE, M.B.A., C.A.
W. KELLY, M.B.A.
J. KENNEDY, M.B.A.
S. J. KENNEDY, M.B.A., R.I.A.
F. PARANCHYCH, M.B.A.
J. PEERS, M.B.A.
F. B. PERRY, B.Com.
A. THESBERG, B.Com., C.A.
A. TUTSCHEK, M.B.A., C.A.
R. YOUNG, B.Com., C.A.

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D. H. BENT, Ph.D. (Director of University Computing Services)
C. G. HOSKINS, Ph.D.
C. T. L. JANSSEN, Ph.D.
L. C. LEITCH, LL.B., M.B.A. (Vice-President, Finance and Administration, of the University)
G. A. MUMEY, Ph.D.
M. M. NAKAMURA, Ph.D.
S. SCHAIBLE, Ph.D.
P. R. WINTERS, Ph.D.

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T. E. DANIEL, Ph.D.
N. A. DOHERTY, Ph.D.
H. M. GOLDBERG, Ph.D.
J. D. JOBSON, Ph.D.
R. M. KORKIE, Ph.D.
A. O. NAKAMURA, Ph.D.
P. P. TALWAR, Ph.D.

Assistant Professors
G. BARONE-ADESI, M.B.A.
F. R. E. HEATH, M.B.A.

Visiting Professor
M. AVRIEL, Ph.D.

Lecturers
C. deBRUIJN, B.Sc.
B. KORDA, D.Sc.
S. STEINHAUER, M.B.A.

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S. M. A. HAMEED, Ph.D.

Associate Professors
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M. M. PARK, LL.M.

Assistant Professor
I. F. IVANKOVICH, M.B.A., LL.B.

Visiting Associate Professor
T. SULLIVAN, Dip.Ec. & P.S., B.A.

Professorial Lecturer
N. SILVERMAN, LL.B., Q.C.

Lecturers
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B. J. KINDRAKE, LL.B.
S. MAH, LL.B.
J. B. McCORMICK, M.B.A.
R. PHILP, LL.B.
M. SHERK, LL.B.
D. SOMMERFELDT, LL.B.
R. SPEIDEL, LL.B.

D. STOLLERY, LL.M.
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G. B. RESCHENTHALER, Ph.D.
R. SAVITT, Ph.D.
R. S. SMITH, Ph.D. (Dean of the Faculty)

Associate Professors
R. L. BECK, Ph.D., C.P.A.
M. J. DUNN, Ph.D.
K. R. MIRUS, Ph.D.,
G. C. PESSIS, Ph.D.
S. P. SINGH, Ph.D.
H. C. YOUNG, Ph.D.

Assistant Professor
R. CHAGANTI, Ph.D.

Lecturers
H. B. CHAN, M.B.A.
P. JOHNSTON, M.B.A., C.A.
F. P. KIRBY, B.Sc., C.A.
W. A. PRESHING, Ph.D.

DEPARTMENT OF ORGANIZATIONAL ANALYSIS

Professor and Chairman
C. A. LEE, Ph.D.

Professors
B. M. HARNDEN, Ph.D.
A. N. B. NEDD, Ph.D.
R. E. SCHNECK, Ph.D.
E. S. SHIHADEH, Ph.D.

Associate Professors
J. L. BROWN, Ph.D.
D. M. CULLEN, Ph.D.
R. V. RASMUSSEN, Ph.D.

Assistant Professors
R. P. GEPHART, Ph.D.
D. M. HEGEDUS, Ph.D.

Lecturers
R. ARMIT, M.B.A.
L. BILIC, B.A., B.Ed.
I. BROWN, B.A.
T. COLLIER, M.B.A.
M. KANE, M.B.A.
G. MICHIELIN, B.Ed.
J. PEERS, M.B.A.

51.1.2 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Registrar of the University
W. A. BLANCHARD, Ph.D.

Department of Economics
A. BUSE, Ph.D.

Faculty of Education
J. FRIS, Ph.D.

Faculty of Extension
R. FARYON, M.B.A.

Faculty of Law
F. A. LAUX, LL.M.

Department of Mathematics
G. CREE, Ph.D.

Representative of the Institute of Chartered Accountants of Alberta
J. HENDERSON, C.A.

Student Representatives
2 M.B.A. STUDENTS
5 UNDERGRADUATE STUDENTS

NOTE: § 51.2 Reserved

51.3 General Information

The Faculty offers the degrees of Bachelor of Commerce and Master of Business Administration.

51.3.1 THE M.B.A. PROGRAM

The degree of Master of Business Administration is designed for students preparing for a career in management.

For further information contact the Associate Dean, Graduate Programs, Faculty of Business Administration and Commerce, consult the pamphlet "The M.B.A. Program at The University of Alberta", and consult § 204.12 of the Faculty of Graduate Studies and Research Calendar.

51.3.2 THE B.COM. PROGRAM

The Bachelor of Commerce program seeks to provide the student with a broad background in the different areas of business as well as in related fields in the humanities and social sciences. The business world and its environment have changed enormously in the last twenty years and will change at an even faster pace in the next twenty. In this trend, questions about the environment will become increasingly important. No school of business can possibly teach the solution to problems which will arise several years from now. A school should, therefore, seek to provide a basis for effective self-learning through actual experience by teaching the broad underlying fields of knowledge which are basic to business. The emphasis is upon the development of a comprehensive analytical framework within which various organizational problems can be analyzed.

51.3.3 CAREER OPPORTUNITIES

The opportunities for Bachelor of Commerce graduates are many and varied. They range anywhere from positions in government (Federal, Provincial, and Municipal) and large enterprises, to partner or owner of small firms.

Opportunities in any given year fluctuate with the general level of economic activity in the country. Although it is generally difficult to forecast the job market several years ahead, the demand for graduates is expected to grow over the next decade; the job market outlook is therefore generally favorable.

Additional information about employment opportunities can be obtained from "University Career Outlook", a pamphlet published by the Department of Manpower and Immigration and "Employment Opportunities Handbook", published by the University and College Placement Association, 254A Main Street N, Markham, Ontario.

Information regarding the various areas of specialization within the field of business administration is contained in § 53.1.4.

51.3.4 STUDENT ORGANIZATIONS WITHIN THE FACULTY

Undergraduate Society

BACUS (The Business Administration and Commerce Undergraduate Society) is the name of the undergraduate student organization within the Faculty. The Society appoints student representatives to Faculty committees and provides liaison between faculty and students.

The Society organizes annual functions such as Monte Carlo Night, Mixers, the Banquet and Dance, and the Bavarian Beer Fest; it also publishes a newsletter called "Occasionally from BACUS".

Undergraduates registered in the Faculty are automatically members of the Society and are entitled to run in BACUS elections for both Executive and Class Representative positions. These representatives sit on BACUS Council which manages the affairs of the Society.

The M.B.A. Association

The M.B.A. Association is the official body representing the Graduate Students in the Faculty of Business Administration. It is a non-profit service organization solely administered by the M.B.A. students.

The purposes of the Association are: to promote fellowship between students through its activities; to promote co-operation and rapport between the students and the academic and administrative staff; to represent the students on all organizations and bodies on which the Association has representation; to promote and extend the academic and non-academic interests of the members through forums, special lectures, and discussion groups; and, to advise, counsel, and act on student problems which cannot be handled effectively through faculty channels.

52 FACULTY REGULATIONS

52.1 Admission

52.1.1 GRADUATE STUDY

For information regarding Graduate Study please consult § 204.12 of the Faculty of Graduate Studies and Research Calendar.

52.1.2 UNDERGRADUATE STUDY

High School Applicants

The detailed minimum requirements for admission are set out in § § 13.1 and 13.5 of the University Regulations and Information for Students Calendar. However, the number of applicants admitted to the Faculty is limited by a quota. Consequently, it may not be possible to admit all who meet the minimum requirements. Academic performance is the primary basis used in selecting the applicants to be admitted. All applications for admission into the B.Com. program must be received not later than July 2, 1981.

Transfers from other Faculties, Colleges, or Universities

A student seeking transfer into the B.Com. program must have a grade point average of 5.0. The number of transfer applicants admitted to the Faculty is limited by a quota. Consequently, it may not be possible to admit all who meet the minimum requirement. Academic performance is the primary basis used in selecting applicants to be admitted. Partial or complete transfer of credit may be granted depending on the nature of the program, caliber of institution, the courses taken, and results achieved. An application for a transfer, complete with all supporting documents, must be received by the Faculty not later than July 2, 1981.

Adult Applicants

Persons 21 years of age and older are considered for admission based upon three Alberta Grade XII examination subjects, including English 30 and Mathematics 30, and relevant experience. Social Studies 30 or Mathematics 31 is recommended as the third subject. All applications under this provision are to be supported by a recommendation from the Student Counselling Office.

All Applicants

Upon notification of acceptance, successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or,

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

(a) Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

(b) Applicants presenting a TOEFL score of less than 600 but 550 or greater will usually be considered as having a minor deficiency. Subject to the requirements of the particular Faculties, such an applicant may be granted provisional admission into

the University but will be required to successfully complete one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in his or her regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated (as in (a) above).

(c) An applicant presenting a TOEFL score of less than 550 will be considered as having a major deficiency in the language of instruction and will not be admitted into The University of Alberta until proficiency can be demonstrated.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

Applications will be considered incomplete until the required test results have been received by the University.

Please note that admission requirements are subject to change and may differ from one year to the next. For further information and application forms please contact the Office of the Registrar, The University of Alberta.

52.1.3 RE-ADMISSION

Students previously enrolled in the Faculty of Business Administration and Commerce who have interrupted their studies by as much as an academic year or more must apply for re-admission by completing an *Application for Re-enrolment* form, which is available from the Office of the Registrar.

Re-admission after being required to withdraw will normally not be approved until at least one year has elapsed since the withdrawal. Application for all such re-admissions must be accompanied by a recommendation from Student Counselling Services.

52.1.4 CONTINUING STUDENTS

Students in good standing who are continuing their program without interruption are not required to re-apply for admission; they need only present themselves for registration.

52.2 Changes in Registration

The Faculty makes every effort to assure that program requirements are being met by the courses in which a student is registered. However, the responsibility for the completeness and accuracy of registration rests with the student, and he/she should be satisfied that the program is in accordance with degree specifications.

52.2.1 ADDING COURSES

THE DEADLINE FOR ADDING FIRST TERM AND FULL-SESSION COURSES IS SEPTEMBER 17 AND FOR SECOND TERM COURSES IS JANUARY 11.

52.2.2 DROPPING COURSES

THE DEADLINES FOR WITHDRAWING FROM COURSES ARE AS FOLLOWS: NOVEMBER 12 FOR A SINGLE-TERM COURSE OFFERED IN THE FIRST TERM, FEBRUARY 12 FOR A FULL-SESSION COURSE, MARCH 1 FOR A SINGLE-TERM COURSE IN THE SECOND TERM.

Courses dropped before the deadline for *adding courses* will not be part of a student's record. A grade of W (withdrawal) will be recorded on a student's record if he withdraws from a course after the deadline for adding courses but prior to the deadline date for dropping courses. No withdrawal after the deadline for dropping courses will be permitted except for major causes beyond the student's control, such as extended illness.

52.3 Withdrawal from the University

Subject to the provisions specified in § 52.2.2, a student is free to withdraw from the University at any time but is encouraged to seek advice from Faculty advisors or Student Counselling Services prior to taking action to do so. Further information regarding fee refunds or exemption from fees may be found in § 15.2 of the University Regulations and Information for Students Calendar.

52.4 Academic Standing and Graduation

(1) Records of academic performance for individual students are maintained in the Student Records Office. Students are encouraged to consult their records from time to time to attest their accuracy.

Academic performance is normally measured by grade-point average attained during the academic year. In this determination, marks of W are ignored throughout; marks of ABF and INF are considered to be marks of 1.

Determination of each student's academic performance will normally occur after the end of the regular academic year, on the basis of the work attempted during that year. However, no student will be classified as probationary or required to withdraw on the basis of fewer than 15 credit hours attempted since initial enrolment in the Faculty or since the last year-end evaluation of performance. A student whose academic performance evaluation is deferred under the terms of this provision may be evaluated at either or both of the following mid-year and year-end times, with appropriate classification and possible action as described above.

(2) If a mark of 3 is obtained in a course, credit will be granted only if all the following conditions are met:

(i) The student's grade-point average for the year is 5.5 or higher.

(ii) The course is neither one required for the degree nor a prerequisite to another one in the student's program.

(iii) The student would not then have more than two half-year courses with marks of 3 in the degree program. (Within the two-year after-degree program, a maximum of one half-year course with a mark of 3 is credited to the degree program.)

(3) *Promotion* of the student from year to year is contingent upon satisfactory academic performance.

Satisfactory performance is defined as that which yields a grade-point average of 5.0 or more.

Probationary performance is that which yields a grade-point average of less than 5.0 but not less than 4.5. In such cases, the student must repeat all work for which a mark of less than 4 was received.

Unsatisfactory performance is that which yields a grade-point average of less than 4.5. In such cases, the student may not continue in the Faculty.

Required to withdraw from University is performance having a quality index of 2.0 or less. (The quality index is the grade-point average multiplied by the credits passed divided by the credits attempted.) In such cases, credit is earned only for courses in which a mark of 5 or more was received.

Students whose performance is either probationary, unsatisfactory, or required to withdraw from University may not write supplemental examinations.

Students whose performance has once been classified as either probationary, unsatisfactory, or required to withdraw from the University, must in all subsequent years in the degree program demonstrate satisfactory performance, or else they may not continue in the Faculty.

(4) *First Class Standing* is awarded to each student who achieves a grade-point average of at least 7.5 on 27 or more credits of academic study during a Winter Session.

(5) The notation *"With Distinction"* is inscribed on the permanent record and graduate parchment if the candidate has obtained a grade-point of 7.5 or higher, averaged over the last two years of the program.

(6) The *Dean's List* commends the superior academic performance of each student who has completed 30 credits of study during the Winter Session with a grade-point average of 8.0 or more.

(7) *Residency.* A student must normally (a) successfully complete at least 20 half-year University of Alberta courses within the B.Com. program, and these during the latter half of the program; (b) be registered as a student in the Faculty of Business Administration and Commerce while taking these courses; and (c) at some time while a student in this Faculty, be registered as a full-time student during at least two terms (not necessarily consecutive) in the regular academic year. Note that these requirements apply to students in the Bachelor of Commerce After-Degree program, except that the number of courses in (a) above is reduced to a minimum of 15.

(8) *Graduation.* In order to qualify for graduation the student must satisfy all degree requirements as specified in § 53.1 below and demonstrate satisfactory academic performance (as defined in (2) above) during the last academic year of the program. If such final year involved less than 15 credit hours of study, a sufficient number of immediately preceding full terms of study shall be added to the basis of evaluation to provide a minimum of 15 credit hours.

The student's attention is directed to the deadlines in the Academic Schedule (§ 11) regarding application for Bachelor of Commerce degrees to be awarded at Spring and Fall Convocations.

52.5 Appeals and Grievances

Students who encounter difficulties affecting their academic performance or standing within the Faculty have three alternative routes which can be followed depending on the nature of the difficulty:

(1) Appeals regarding the student's standing in a particular course should first be directed to the particular instructor(s) involved. Problems not resolved in this way may be appealed through reappraisal of final examinations and course marks as provided in Section 16.3.3(2) of the University Calendar. The remaining matters of appeal should be directed to the Associate Dean.

(2) Where the appeal involves a ruling concerning graduation or continuation in the B. Com. program, (except for the normal exercise of program requirements which are applied to all students), the appeal may be heard by the Faculty Academic Appeals Committee. If the student wishes to carry the appeal further, the appeal may be directed to the General Faculties Council Academic Appeals Committee (Sec. 16.7 of the University Calendar).

(3) For those appeals which concern admission or re-admission to the Faculty, the granting of credit taken outside the Faculty, and other administrative matters, the final authority rests with the Associate Dean.

For grievances related to matters other than academic performance, the student may consult either the Associate Dean or the Business Administration and Commerce Undergraduate Society.

52.6 Student Advising

Five concurrent courses is the maximum normally permitted during the Winter Session. Students wishing to register in more than five courses in a term must obtain the approval of the Associate Dean via the Student Records Office.

Advice to undergraduate students regarding academic matters is provided by two groups:

The Faculty Student Records Office handles questions concerning admission, re-enrolment, transfer, withdrawal, registration, course changes, degree requirements, after-degree programs, advanced credit, etc., and maintains records of course registration and final grades.

Members of the Faculty offer advice regarding broader and more general questions, courses in different areas of business and other fields of study, preparation for graduate programs, etc. Students are encouraged to consult faculty members about their programs.

53 PROGRAMS OF STUDY

53.1 The Degree of Bachelor of Commerce

53.1.1 DETAILED REQUIREMENTS

The four-year B.Com. degree requires 120 credits of academic study. Courses typically involve three lecture hours per week; some courses have additional time scheduled for laboratories or seminars. Required subjects total 66 credits, as listed below. The remaining 54 credits are taken in elective subjects selected from the areas indicated below.

REQUIRED COURSES

	Credits
Accounting 202 and 204	6
Business 401	3
Economics 201 and 202	6
English (See note 1 below.)	6
Finance 304	3
Industrial Relations 304	3
Legal Relations 310	3
Management Science 306, 307, 356, and 357 (See note 2 below.)	12
Managerial Economics 312, 323, and 333	9
Mathematics 240 and 243 (See note 3 below.)	6
Marketing 304	3
Organization Theory 303 and 305	6

The following courses are formally recognized as substitutes for the corresponding course listed above:
ECON 373 for Managerial Economics 312
ECON 381 for Managerial Economics 323
ECON 382 for Managerial Economics 333
MATH 202 or 203 or 242 for MATH 240
CMPUT 214 or 351 or 357 for Management Science 357.

Other courses may be recognized as substitutes on a case by case basis; contact the Student Records Office for this purpose.

NOTE: Degree credit will not be granted for a course and its substitute as indicated above. Further, degree credit will not be granted for both of a pair of courses where prohibited in the calendar description of either of them.

ELECTIVES

Social Sciences (See note 4 below.) (Maximum of 6 credits at the 200-level.)	9
Business Administration & Commerce (All must be at the 300- or 400-level.)	15
Other than Business Administration and Commerce (Maximum of 6 credits at the 200-level.)	9
Unrestricted electives (Maximum of 3 credits at the 200-level.)	21

(1) The English requirement must be completed during the first two years of the program.

The six credit hours English requirement consists of one single-term course in English Language and Literature and one single-term course in English Composition. The Department of English does not presently offer a course in English Composition generally open to Commerce students. Until provisions for such a course are made, any six credit hours given by the Department of English will be accepted.

(2) Students with an interest in computers are encouraged to substitute CMPUT 214 or 351 for MGTSC 357; CMPUT 215 is suggested as one of the open junior electives, or CMPUT 352 as a senior open elective.

(3) Students with an interest in mathematics are encouraged to substitute MATH 202, or 203, or MATH 242 for MATH 240; MATH 204 is suggested as one of the open junior electives.

(4) Social Sciences electives are courses offered by the Departments of Anthropology, Economics, Geography, Educational Psychology, History, Philosophy, Political Science, Psychology, and Sociology.

(5) Students intending to meet the requirements of the Institute of Chartered Accountants of Alberta should take a minimum of ACCTG 302, 402, 403, 404, 406 and MANEC 421. Other provinces may have different requirements. Students should contact the provincial institute to determine other professional requirements.

(6) Students intending to meet the requirements of the Society of Management Accountants (RIA), should take the following courses: ACCTG 302, 304, 402, 404, 406, 408, 412, MANEC 421 and one senior finance course. Students should contact the society to determine other professional requirements.

(7) Students wanting to choose elective courses which satisfy the educational requirements of other professional organizations are encouraged to obtain advice and suggestions directly from the organization(s) of interest.

(8) Students intending to specialize in Food Service Administration should take CHEM 250, MICRB 315, FD NU 320, 321, 325, 327, 429, and two additional courses in Foods and Nutrition or Food Science. Further information is available from the Faculty of Home Economics.

53.1.2 FLOW DIAGRAM OF PREREQUISITE RELATIONSHIPS

If a given course builds directly upon material covered in another course, the latter is a prerequisite. Prerequisites are represented by arrows extending from left to right, from the prerequisite course to the succeeding course or courses.

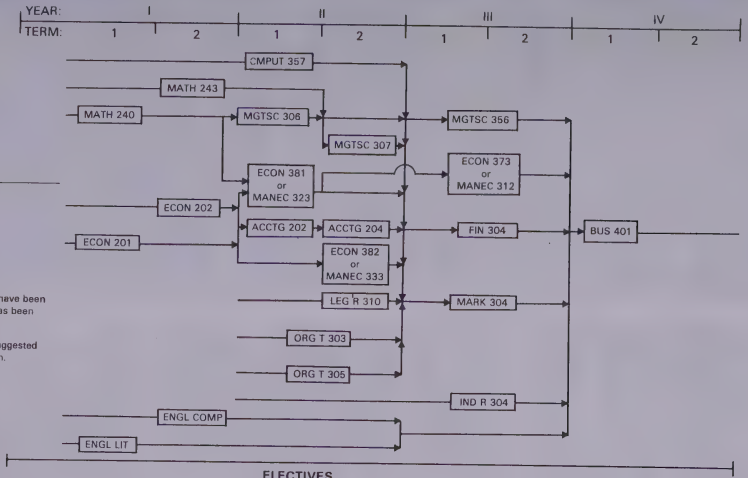
The position of a course in the diagram reflects its relative position in the program. The course boxes in the diagram have been positioned so as to indicate when a course is likely to be taken. However, a course does not have to be taken in the particular term indicated. Rather, its relationship to preceding and ensuing courses, as indicated by the arrows, determines the time by which it has to be taken in order not to delay future required courses. However, most courses have a certain leeway in this respect. This leeway is indicated by the lines extending in both directions from the respective course box.

In addition to the prerequisite relationships indicated below it is generally recommended that MATH 243 and MGTSC 357 be taken before MGTSC 307 and ACCTG 204; and English composition before ORG T 303.

53.1.3 B.COM. PROGRAM AFTER APPROVED DEGREE

Normally, the holder of an approved degree may qualify for the Bachelor of Commerce degree upon completion of twenty selected half-year courses. Further information is available from the Student Records Office.

DIAGRAM OF PREREQUISITE RELATIONSHIPS



DECLARED MAJOR: _____

Courses marked "X" have been completed or credit has been granted.

Courses circled are suggested for the coming session.

ELECTIVES

NOTE: NUMBERS IN PARENTHESES DESIGNATE 300 or 400 LEVEL COURSES.

SOCIAL SCIENCE ELECTIVES
Courses from: Anthro., Econ., Geography, Ed. Psych., Hist., Philosophy, Pol.Sc., Psych., Sociology.

3
3
(3)

SENIOR BUSINESS ELECTIVES
Any undergraduate course in Commerce.

(3)
(3)
(3)
(3)
(3)

NON-BUSINESS ELECTIVES
Any course outside of Commerce

3
3
(3)

OPEN ELECTIVES
Any course in University

3
(3)
(3)
(3)
(3)
(3)
(3)

53.1.4 AREAS OF SPECIALIZATION

Students can specialize in any of the areas of business mentioned in § 53.1.1, or in other areas of study offered at the University by selecting their options accordingly. A description of the various areas of specialization follows.

Accounting

Accounting may be described as the study of methods of developing and preparing financial and other information essential to the efficient conduct and evaluation of the activities of an organization. Such information is employed:

(1) in effective managerial planning, control, and decision-making; and,

(2) in discharging the accountability of organizations to investors, creditors, government agencies, taxing authorities, employees, and other users.

Accounting includes the development and analysis of data, the testing of its validity and relevance, and the interpretation and communication of the resulting information to intended users.

Finance

The finance program has three facets — (a) business finance, (b) the institutions of finance, and (c) financial topics of interest to individuals.

(a) Business finance includes the evaluation of the business firm's need for money, and the choice of how this money may be procured.

(b) Financial institutions include stocks and bond markets, brokers and investment banks, commercial banks and other lending institutions, government agencies that participate in, or regulate, financial processes, and other aspects of the financial environment.

(c) Financial topics of interest to individuals include the development of personal investment plans, the problems of evaluating and acquiring common stocks and other investment opportunities, and the analysis of insurance.

These topics are closely related. The intelligent practice of personal and business financing requires a knowledge of institutions. Personal and business financing are often two sides of the same coin, with the personal investor acting as a buyer for securities that are sold by a business.

Industrial Relations

Industrial relations involves a study of the "people" related problems of a business. As such, the study of industrial relations may include the study of:

(a) trade union / management relations.

(b) the labor market and the problems of recruiting, selecting, and training a labor force.

(c) interpersonal relations both within and between groups in the organization.

(d) superior / subordinate relations.

(e) management's relations with government and government agencies.

This field of study brings together and applies much of the basic information developed in the disciplines of economics, psychology, sociology, political science, and mathematics.

Interest in the industrial relations field has constantly been expanding over the past few decades. This increase has come about, in part, because of: (1) The development of the trade unions into new areas and the importance of trade unions and their collective bargaining activities upon the Canadian economy. (2) The increased emphasis upon specialization and efficiency of operation has placed increased pressure upon the manpower recruitment and training activities of the business firm. (3) The appreciation by most business of the importance of the contribution to productivity made by their work force and their consequent interest in such things as morale, motivation, group dynamics, etc.

Management Science

Management science is a systematic, explicit, and often multi-disciplinary study of management systems. It is the application of scientific method to the decision problems of business and other units of social organization such as government. Management science typically involves the creation of a mathematical model of a given system and an examination of the behaviour of that model under a set of policies including, possibly, optimization with respect to some objective function and finally interpretation of the results of the modelling effort back into the real world situation. The B.Com. student will find study of management science valuable in several ways. Knowledge of the field permits one (a) to determine when such a study will contribute to managerial decision-making, (b) to interact effectively with specialists in the field, and (c) to interpret properly the study results and apply them wisely to the problem at hand. Another is the training in logical, sequential thought that one obtains and in particular the use of model building as a research technique.

Managerial Economics

Managerial Economics studies:

(a) the environment in which business operates (i) at the micro level in examining the allocation of resources through the price system and the government's role in such a system, (ii) at the macro level in examining relationships between economic aggregates and government policy regarding problems such as inflation, unemployment, and growth rates, and

(b) applications of economic concepts and methods of analysis in business decision-making.

Marketing

Marketing is a system of interacting business and organizational activities designed to plan, develop, price, promote, and distribute products and services. It is the study of how and why people develop and consume goods and services.

Traditionally, the study of marketing includes only three business activities; transfer of title, physical supply, and related facilitating functions. These three activities included bringing buyers and sellers together, storing and distributing goods, and supplying credit, market information, and other market supporting services. However, the study of marketing has expanded to include an understanding of the environment in which marketers operate. In addition, it includes study of the impact of the aggregate marketing process on the individuals who are both members of society, and members of the firms and organization involved in the marketing process. Also, marketing concepts are being applied to many non-business activities such as electing political leaders and promoting government programs and agencies.

Because of the increased breadth of marketing and the complexity and magnitude of the decision marketers must take, this subject draws upon most disciplines and many data sources. It requires a good understanding of both qualitative and quantitative concepts, models, theories, and techniques. The breadth of information and knowledge aids in planning, controlling, evaluating and reformulating marketing operations.

Organization Theory and Behavior

Organization behavior is the study of human behavior within the context of formal organizations such as business firms, government agencies, hospitals, th

military, the church, and informal organizations such as industrial work groups. It is differentiated from the study of human behavior in general in that the focus is on behavior within the boundaries of an organization. Organization behavior seeks to provide an understanding of the psychological, sociological, and anthropological aspects of managing and developing human resources. Therefore, the field emphasizes the study of the behavior of individuals, pairs of individuals, small groups, organizational structure, interorganizational relationships, environment-organization relationships, and societal values.

Other Areas

Careful selection of electives permits a student to develop a specialization in a number of areas outside the Faculty of Business Administration and Commerce. These areas include, but are not limited to, Agricultural Economics, Computing Science, Economics, Food Service Administration, Political Science, Psychology, and Sociology.

53.1.5 DESIGNATED MAJORS

At any time prior to graduation, each student has the option of formally designating not more than one of the following areas as a major field of study: Accounting, Finance, Management Science, Marketing, or Industrial Relations. Information about the detailed requirements of each major field is available from the Student Records Office of the Faculty.

Completion of the requirements of a designated major is acknowledged by a suitable notation on the student's permanent University transcript.

54 DETAILS OF COURSES

54.1 General Information

All courses taught by the Faculty of Business Administration and Commerce are listed and briefly described below. Although many of the other courses of potential interest to Commerce students are also listed, any course offered within the University may be counted as an elective within the B.Com. program.

Each course is designated by its abbreviation and number. Students must use this abbreviation and number when filling in their registration forms.

Courses numbered 100 through 199 are introductory, usually equivalent to high school courses. Those numbered 200 through 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 through 499 are senior courses, normally taken after the first year. Courses numbered 500 and above are normally restricted to graduate students.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours.

Normally, a full-year course has a weight of six and a half-year course a weight of three, with or without laboratory hours as indicated. If the course is a single-term course, the term in which it is usually offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL BE OFFERED IN THE FORTHCOMING SESSION. IT IS NOT INTENDED THAT ALL COURSES SHALL BE OFFERED EACH YEAR. FURTHERMORE A NUMBER OF CHANGES USUALLY OCCUR AFTER THE PREPARATION OF THE CALENDAR. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

54.2 Accounting

ACCTG 202. *Introductory Accounting.* ★3 (either term, 3-1.5s-0). Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors, and other external decision-makers. Prerequisites: ECON 201/202.

ACCTG 204. *Managerial Information and Control Systems.* ★3 (either term, 3-0-2). Corporate goals, planning and control concepts, cost accumulation for pricing purposes, and product costing. Prerequisite: ACCTG 202.

ACCTG 270. *Legal Accounting.* ★2 (First Term, 3-0-0). Areas of accounting useful to a practising solicitor. Note: For non-Commerce students only.

ACCTG 302. *Intermediate Financial Accounting.* ★3 (either term, 3-0-2). An in-depth treatment of the theory and methods of the GAAP (Generally Accepted Accounting Principles) model of Accounting, and an evaluation of its strengths and weaknesses. Comparative reference to alternative Accounting models will be made on a selective basis. Prerequisites: ACCTG 202, ACCTG 204, MANEC 323. Open only to Business Administration and Commerce Students or by consent of the Department Chairman.

ACCTG 304. *Accounting Information Systems.* ★3 (either term, 3-0-2). Introduction to total information systems with emphasis on the role of accounting, using both conceptual reviews and case material pertaining to decision-making by owners, creditors, and managers. Accounting 304 is recommended for students concentrating in Accounting. Prerequisite: ACCTG 204. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 307. *Financial Accounting.* ★3 (either term, 3-0-1.5). Accounting and reporting to persons outside of the organization. Note: Not open to students registered in the Faculty of Business Administration and Commerce.

ACCTG 308. *Managerial Accounting.* ★3 (Second Term, 3-0-2). Concepts employed to manage the planning and control aspects of organizations. Prerequisite: ACCTG 307 or permission of instructor. Note: Not open to students registered in the Faculty of Business Administration and Commerce.

ACCTG 309. *Financial and Managerial Accounting.* ★3 (either term, 3-0-2). Accounting for non-business majors. Note: Not open to students registered in the Faculty of Business Administration and Commerce.

ACCTG 402. *Accounting Theory.* ★3 (either term, 3-0-0). An examination of the structure of accounting theory, including a thorough study of theories of income and value relevant to accounting. A framework for evaluating these theories, including the theories supporting generally accepted accounting principles, is considered. Other current topics in financial accounting may be included from time to time. Prerequisites: ACCTG 302, FIN 304. Open only to fourth-year Business Ad-

ministration and Commerce students, or by consent of the Department Chairman.

ACCTG 403. *Advanced Financial Accounting.* ★3 (either term, 3-0-0). Analysis of complex accounting problems with emphasis on current issues in accounting practice. Prerequisite: ACCTG 402. Open only to fourth year Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 404. *Intermediate Managerial Control Concepts.* ★3 (either term, 3-0-0). Accounting for managerial decision-making. Emphasis on cost and revenue accumulation for control and pricing problems as well as on product costing. Prerequisites: ACCTG 204, MGTSC 356, ORG T 303, ORG T 305, or consent of the Faculty. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 406. *Advanced Managerial Control Concepts.* ★3 (either term, 3-0-0). Current research and cases in managerial accounting. Prerequisites: ACCTG 404. Open only to fourth year Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 408. *Advanced Accounting Information Systems.* ★3 (Second Term, 3-0-0). Managerial decision-making with stress on the role of accounting measurements. Emphasis on the use of the computer in processing data. Prerequisite: ACCTG 304. Open only to Business Administration and Commerce students or by consent of the Department.

ACCTG 410. *Research in Accounting.* ★3 (Second Term, 3-0-0). Preparation of research reports on topics of interest. Prerequisites: ACCTG 402 and 404. Open only to fourth year Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 412. *Auditing History, Theory, and Current Thought.* ★3 (either term, 3-0-0). Internal and external auditing history and philosophy. Functional or operational auditing, the nature of evidence, ethics, and independence. Prerequisite: ACCTG 302. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, ACCTG 446, 447, 448 and 449.)

NOTE: The remaining courses in this section are open to graduate students only.

ACCTG 452. *Introductory Financial Accounting.* ★3 (First Term, 3-0-0).

ACCTG 453. *Managerial Control Systems.* ★3 (Second Term, 3-0-0).

ACCTG 561. *Seminar in Financial Accounting Theory.* ★3 (First Term, 3-0-0).

ACCTG 562. *Seminar in Management Accounting.* ★3 (Second Term, 3-0-0).

ACCTG 563. *Seminar in Current Accounting Issues.* ★3 (Second Term, 3-0-0).

ACCTG 900. *Non-Thesis Project* ★3 (variable).

54.3 *Agricultural Economics*

Department of Rural Economy

NOTE: FOR A COMPLETE LISTING OF AGRICULTURAL ECONOMICS COURSES SEE § 34 OF THE FACULTY OF AGRICULTURE AND FORESTRY CALENDAR.

Departments in round brackets offer Interdepartmental courses jointly. Square brackets indicate the department in which students register.

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relation of the agricultural sector to the economy as a whole; analysis of structural change, economic growth and adjustment in agriculture. Prerequisites: ECON 200 or 201/202. (Department of Rural Economy and the Department of Economics.) Note: Formerly INT D 367. [Rural Economy]

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). A survey of world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities. Prerequisites: ECON 200 or 201/202. (Department of Rural Economy and the Department of Economics.) Note: Formerly INT D 368. [Rural Economy]

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). The rural community and rural social system with special reference to changes in the rural way of life. Prerequisite: R SOC 300 or SOC 202 or 403 or consent of the Department. (Department of Rural Economy and the Department of Sociology.) Note: Formerly SOC/R SOC 356. [Rural Economy]

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). Economics of natural resources related to agriculture and forestry; conservation, population, resource scarcity, property and tenure institutions, economic rent and resource pricing, resource development and evaluation, environmental protection, public resource policy. Prerequisites: ECON 201; ECON 202 recommended. Note: Not open to students with credit in ECON 365. (Offered jointly by the Departments of Rural Economy and Forest Science.) [Rural Economy]

AG EC 323. *Management for Agricultural and Forest Business* ★3 (First Term, 3-0-0). Principles of management applied to farm and forest supply, service, and distribution businesses. Prerequisite: AG EC 203 or ECON 201/202 or equivalent.

AG EC 333. *Introduction to Farm and Ranch Management.* ★ (either term, 3-0-2). Application of economic principles to the organization and operation of a farm business. Introduction to farm records and business analysis; the management process and decision criteria for choice of enterprises, size of business, resource utilization, and timing of production; alternative methods of obtaining farming resources by purchase, leasing and credit. Prerequisite: AG EC 203 or ECON 201 or equivalent.

AG EC 381. *Retail Marketing of Agricultural Products.* ★ (Second Term, 3-0-0). Wholesale and retail food market structures and conduct, with emphasis on consumer motivation, retail pricing strategies, and operational techniques and problems. Note: Not recommended for those specializing in Agricultural Economics. Prerequisite: AG EC 203 or ECON 201/202 or equivalent.

AG EC 384. *Marketing of Agricultural and Forest Products.* ★ (either term, 3-0-0). Principles of marketing. Functions and institutions of markets. Market systems, price behavior, and futures markets for agricultural and forest products. Prerequisite: AG EC 203 or ECON 201/202 or equivalent.

AG EC 423. *Management Techniques in Agriculture and Forestry.* ★3 (Second Term, 3-0-0). Application of decision making techniques to the management of agricultural and forest businesses; computer assisted management game and selected case studies. Prerequisite: AG EC 323.

AG EC 433. *Advanced Farm and Ranch Management.* ★ (Second Term, 3-0-0). Application of concepts and tools in farm business management in farm planning and farm management extension. Manual and computerized methods of farm accounting, business analysis and planning; interpretation and use of information for decision making in organizing and operating a farm business to achieve goals; planning under risk and uncertainty; farm business arrangements and strategies for growth. Prerequisite: AG EC 333 or equivalent.

AG EC 484. *Agricultural Marketing Economics.* ★3 (Second Term, 3-0-0). Structure and performance of agricultural markets. Applied agricultural market and price issues. Note: Formerly AG EC 463. Prerequisite: AG EC 384 or equivalent.

AG EC 485. *Agricultural Prices and Trade.* ★3 (Second Term, 3-0-0). Price determination, future prices, and price behavior over time; exercises in statistical price analysis; theory of trade; trade and commodity agreements. Prerequisite: AG EC 203 or ECON 201/202; AG EC 384 recommended.

54.4 *Anthropology*

Department of Anthropology

NOTE: FOR A COMPLETE LISTING OF ANTHROPOLOGY COURSES SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

ANTHR 202. *Man and Culture.* ★6 (3-0-0). An introduction to anthropological thought concerning such topics as race, evolution, culture growth and culture change. Not open to students with credit in ANTHR 306 or 307.

ANTHR 250. *Race and Racism in the Modern World.* ★3 (either term, 3-0-0). The challenge of racism in modern societies and the response of anthropology, including the history of the "race" concept in explaining human variation and the uses of racialist notions in discussions of individual and social differences.

ANTHR 307. *Introduction to Social and Cultural Anthropology.* ★3 (either term, 3-0-0). The comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics and political institutions and religion; process of change. Note: Not open to students who have taken ANTHR 202.

ANTHR 308. *Introduction to Linguistic Anthropology.* ★3 (either term, 3-0-0). The anthropological study of language and communications. A brief survey of field and analytical methods and the theory of linguistic anthropology.

ANTHR 309. *Introduction to Physical Anthropology.* ★3 (either term, 3-0-0). Survey of theory and basic data in human evolution and human variation. Topics include primatology, osteology, hominid paleontology, variation in modern populations.

ANTHR 327. *Indigenous and Cultural Minorities in the Modern World.* ★6 (3-0-0). The survival of indigenous and minority cultures in various societies. Anthropological perspectives on the relationships among race, class, culture, and politics, and on genocide, ethnocide, and the future of native peoples in the modern state. Prerequisite: An introductory course in social or cultural anthropology or sociology.

ANTHR 330. *Technology in Culture.* ★3 (either term, 3-0-0). An anthropological introduction to the evolution of tools and techniques; the adaptation of society to environment through technology; the interrelationship of technology, ideology, and social organization.

ANTHR 346. *Peoples and Cultures of the Circumpolar Region.* ★3 (either term, 3-0-0). Comparative study of indigenous Arctic and sub-Arctic societies. Archaeological and ethnological considerations of northern societies of the Old and New Worlds.

ANTHR 350. *Indians of North America.* ★6 (3-0-0). A survey of North American Indian cultures and civilizations. Special attention given to social organization, economic systems, prehistoric and historic social change. Some emphasis on Indians of Canada in historic and present day perspectives.

ANTHR 355. *Contemporary Canadian Native Peoples.* ★3 (either term, 3-0-0). Anthropological perspectives on some current situations of native peoples in Canada.

ANTHR 410. *Sex and Status in Comparative Perspective.* ★3 (either term, 3-0-0). Sexual status as a biological and as a cultural phenomenon. The social position of women in various societies. Prerequisite: a senior-level course in Anthropology or Sociology.

ANTHR 423. *Ecological Anthropology.* ★3 (either term, 3-0-0). A consideration of the relationships between culture and the environment. Problems involving the application of basic ecological concepts and principles to human societies and evaluation of various explanatory frameworks regarding cultural adaptations. Prerequisite: ANTHR 202 or 306 or 307, or consent of the Department. Note: Formerly part of ANTHR 422.

ANTHR 424. *Economic Anthropology.* ★3 (either term, 3-0-0). An introduction to the literature and controversies within the field, with special emphasis on systems of exchange. Prerequisite: ANTHR 202 or 307, or consent of the Department.

ANTHR 425. *Anthropology of Work and Production.* ★3 (either term, 3-0-0). The organization of work and production with emphasis on the effects of development on subsistence economies. Prerequisite: ANTHR 202 or 307, or consent of the Department.

ANTHR 431. *Multilingualism.* ★3 (either term, 3-0-0). Emphasis will be on multilingual communities. Prerequisite: ANTHR 202 or 308, or consent of the Department.

54.5 Business

BUS 201. *Business in Society I.* ★3 (either term, 3-0-0). A survey of the place of business in society.

BUS 203. *Business in Society II.* ★3 (Second Term, 3-0-0). Special topics concerning the role of business in society. Prerequisite: BUS 201 or consent of instructor.

BUS 300. *Administrative Principles.* ★6 (3-0-0). Functions of management — planning, organization, staffing, directing, controlling. Note: For non-Commerce students only.

BUS 304. *Organizational Behavior.* ★3 (either term, 3-0-0). An examination of the structure and functioning of complex organizations; the formation and interaction of groups within organizations; and the resulting experiences of, and influences on, the individual.

BUS 365. *Administration of the Small Business.* ★3 (either term, 3-0-0). Issues related to the small business. Prerequisite: FIN 304.

BUS 401. *Theory of Policy Making.* ★3 (either term, 3-0-0). Case studies in business policy. Prerequisites: MANEC 312, FIN 304, IND R 304, MGTSC 356, and MARK 304.

BUS 402. *Field Studies.* ★3 (Second Term, 3-0-0). Field studies in policy making. Prerequisite: BUS 401.

BUS 410. *Social Problems Affecting Business.* ★3 (either term, 3-0-0). An analysis of contemporary social problems faced by Canadian Business. The course will examine such problem areas as employment discrimination, automation, educational opportunities, changing social values and attitudes of employees and management, crime and income distribution. Prerequisite: Consent of instructor.

NOTE: The remaining courses in this section are open to graduate students only.

BUS 502. *Seminar in Management Information Systems.* ★3 (either term, 3-0-0).

BUS 553. *Research Methodology.* ★3 (either term, 3-0-0).

BUS 555. *Business Policy I.* ★3 (either term, 3-0-0).

BUS 556. *Business Policy II.* ★3 (either term, 3-0-0).

NOTE: § 54.6 — Reserved.

54.7 Computing Science

Department of Computing Science

NOTE: FOR A COMPLETE LISTING OF COMPUTING SCIENCE COURSES OFFERED SEE § 184 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR.

NOTE ON CREDIT FOR INTRODUCTORY COURSES: credit will be granted for only one of CMPUT 214, 261, 300, 351, and 357, and for only one of CMPUT 215 and 352.

CMPUT 214. *Introduction to Computing Science.* ★3 (First Term, 3-0-3). History and application of computers; algorithms; flow diagrams; use of a high level programming language in the solution of elementary numerical and non-numerical problems. Corequisite: MATH 207, 202 or 203 or consent of the Department. See above note on credit for introductory courses.

CMPUT 215. *Elementary Data Structures.* ★3 (Second Term, 3-0-3). Representation and manipulation of data structures by a high level language; strings; arrays; linked lists; stacks; queues; trees; applications of data structures. Prerequisite: CMPUT 214. Corequisite: MATH 208 or 204 or consent of the Department. See above note on credit for introductory courses.

CMPUT 314. *Foundations of Computing Science.* ★3 (First Term, 3-0-3). Review of sets and relations; digraphs; applications of Boolean algebra; minimization; topological sorting, maximal flow and scheduling network algorithms; paths and cycle algorithms; finite representations of numbers and discrete structures; systematic programming; correctness of programs; algorithms, automata and formal grammars. Prerequisite: CMPUT 215 or 352. Credit will be granted for only one of CMPUT 314 or 364.

CMPUT 315. *Computer Organization and Programming.* ★3 (Second Term, 3-0-3). Computer architecture; physical characteristics of input, output, and storage devices; detailed study of an assembler language including macros; subroutines, coroutines, and input-output operations; elementary operating systems concepts, programming aids; loaders, assemblers, compilers, program libraries. Prerequisite: CMPUT 215 or 352. Credit will be granted for only one of CMPUT 315 or 365.

CMPUT 351. *Elements of Programming I.* ★3 (either term, 3-0-3). Basic programming techniques using a high level language; representation and manipulation of numeric and non-numeric data; survey of computing systems, history and applications. See above note on credit for introductory courses.

CMPUT 352. *Elements of Programming II.* ★3 (Second Term, 3-0-3). Problem solving; organization of data files; representation and manipulation of data structures; interfacing with operating systems; structure of computers; input-output and storage devices; introduction to assembler language programming and other programming languages. Prerequisite: CMPUT 214, 262, 300 or 351. See above note on credit for introductory courses.

CMPUT 357. *Introduction to Computing for Business Applications.* ★3 (either term, 2-0-1). Introduction to programming using a higher-level language; program libraries; simulation; computer-oriented systems and the management decision-making process. Formerly MGTSC 357. See above note on credit for introductory courses.

CMPUT 417. *Basic File Management.* ★3 (Second Term, 3-0-0). The use of computers for file management and associated automatic information processing with concurrent study of and practice with the COBOL language. Prerequisite: CMPUT 315 or 365.

54.8 Economics

Department of Economics

NOTE: FOR A COMPLETE LISTING OF ECONOMICS COURSES OFFERED SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

ECON 201. *Introduction to Micro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy: the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy: the distribution of income, inequality and poverty; the use of the environment; government economic policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy: national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies: international trade theory, problems and government policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 323. *International Economics.* ★3 (either term, 3-0-0). A survey of the principles of international economics and the application to economic policy. The topics are foreign trade, foreign investment, and the balance of payments. Prerequisites: ECON 201/202 or consent of the Department.

ECON 331. *Labor Economics.* ★3 (First Term, 3-0-0). Theory and empirical evidence concerning the supply of and demand for labour services, wage differentials and the impact of unions. Some of the policy issues to be discussed are income maintenance, unemployment insurance and minimum wage legislation. Prerequisites: ECON 201/202 or consent of the Department.

ECON 332. *Manpower Economics.* ★3 (Second Term, 3-0-0). Analytical and policy issues relating to human resource development and manpower utilization, with particular reference to Canadian comtemporary issues. Prerequisite: ECON 331 or consent of the Department.

ECON 334. *Economics of Poverty.* ★3 (either term, 3-0-0). An examination of the economic factors associated with low income levels and standards of living of various Canadian occupational groups. Proposals to alleviate certain low income problems — the guaranteed income plan, the negative income tax proposition, etc. A critical appraisal of existing Federal, Provincial and Municipal programs in the Welfare and related fields. Prerequisites: ECON 201/202 or 306/307 or 304 or consent of the Department.

ECON 341. *Money and Finance.* ★3 (First Term, 3-0-0). Analysis of money and credit in the exchange process; the savings-investment process; commercial banking; financial intermediaries; financial markets; central banking. Prerequisites: ECON 201/202 or consent of the Department.

ECON 351. *The Public Sector.* ★3 (First Term, 3-0-0). The rationale of the public sector and its development in Canada; analysis of public decision-making and the budgetary process. Prerequisites: ECON 201/202 or consent of the Department.

ECON 352. *Economics of Taxation.* ★3 (either term, 3-0-0). Analysis of the effects of alternative levels of total taxation (budgetary tax policy) and alternative types of taxes (tax mix policy) on the economic decisions of households and business firms as reflected in the composition of national output, the distribution of national income and the level and stability of economic activity. Prerequisites: ECON 201/202 or consent of the Department.

ECON 353. *Taxation Policy and Structure.* ★3 (Second Term, 3-0-0). Analysis of the Canadian tax structure and its role in attaining certain goals of society: requirements for an optimal tax structure. Prerequisites: ECON 201/202 or consent of the Department.

ECON 355. *Economic Analysis in the Evaluation of Large-Scale Projects.* ★3 (either term, 3-0-0). An examination of the use of cost-benefit analysis, location theory and input-output analysis in assessing the economic merits of various large-scale investment projects. Examples of current interest will be used, e.g., river basin, electrical generation, and oil and gas projects. Prerequisites: ECON 201/202, or consent of the Department.

ECON 356. *The Economics of Education.* ★3 (either term, 3-0-0). An examination of the resource allocation within the educational sector of the economy. Selected topics dealing with education today as an input into production and consumption tomorrow, manpower planning and education, educational planning and decision-making, productivity and cost considerations in the educational firm, and the use of budgetary systems in allocating resources within the educational sector. Prerequisite: Consent of the Department.

ECON 361. *Transportation Economics.* ★3 (either term, 3-0-0). Economic analysis of alternative transportation systems (water, air, road and rail, for both freight and passengers). Role of transportation in urban, regional and national economic development. Public policy towards transportation. Prerequisites: ECON 201/202.

ECON 362. *Introduction to Urban Economics.* ★3 (either term, 3-0-0). An examination and analysis of the relationships of urbanization and economic growth, the economic aspects of urban spatial organization, housing, and transportation, and the urban public economy. Special attention to Canadian urban economic issues. Prerequisites: ECON 201/202 or 304 or 306/307 or consent of the Department.

ECON 363. *Introduction to Regional Economics.* ★3 (either term, 3-0-0). An appraisal of the historical and current pattern of regional income disparities in Canada, with analysis emphasizing the causes of regional variations in employment and economic growth levels. An assessment of present federal and provincial policies designed to alleviate regional disparities will be made, combined with new policy programmes that may be relevant. Prerequisites: ECON 201/202 or consent of the Department.

ECON 364. *Economics of the Prairie Region.* ★3 (either term, 3-0-0). Economic history and the contemporary economic situation; agriculture, resources development, potential for economic diversification in manufacturing and service industries, the prairie region in the national economy — tariffs, transportation, monetary policy, energy policy. Prerequisites: ECON 201/202 or 304 or 306/307.

ECON 365. *Resource Economics.* ★3 (either term, 3-0-0). Problems of allocation and development of natural resources, including contemporary Canadian resource policy issues; nature and types of resources; the economics of conservation and resource scarcity; and the role of resources in growth. Prerequisite: ECON 201/202 or 304 or ECON 306/307.

ECON 366. *Energy Economics.* ★3 (either term, 3-0-0). Types of energy resources, substitutability, conversion. The relevance of energy to economic growth. Energy as input and as a consumers' good. An overview of quantities available and used. The problems of measuring energy, the energy balance, the energy industries. The role of energy in the Canadian economic development. World energy markets. Energy policy problems. Prerequisites: ECON 201/202, ECON 304, or ECON 306/307.

ECON 373. *Industrial Organization.* ★3 (either term, 3-0-0). A survey of the behavior and performance of firms in different market structures, and discussion of public policy towards the

different structures. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 312.

ECON 374. *Economics of Regulation.* ★3 (either term, 3-0-0). The study of the economic issues relating to the regulation and the operation of provincial and federal regulatory bodies in a number of industries. Among the industries studied are the natural gas and electrical utilities, and the transportation and communication industries. Prerequisites: ECON 201/202, ECON 306/307 or ECON 304.

ECON 381. *Micro-Economic Analysis I.* ★3 (either term, 3-0-0). The theory of consumer behavior; theory of production and cost: price and output determination under competition, monopoly and other market structures. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 323.

ECON 382. *Macro-Economic Analysis I.* ★3 (either term, 3-0-0). National income concepts and income determination; theories of aggregate consumption, investment and employment behavior; monetary and fiscal policy. Prerequisites: ECON 201/202 or consent of the Department. Not open to students with credit in MANEC 333.

ECON 391. *Economic Institutions and Ideologies.* ★3 (either term, 3-0-0). Pre-capitalist Europe; the rise of individualism and the individualistic ethic; industrial capitalism; economics of Marx and Socialism; the rise of corporate capitalism; the consolidation of monopoly power; economic imperialism; Keynesian economics and economic policies; contemporary capitalism and its critics.

ECON 394. *The Political Economy of the New Left.* ★3 (either term, 3-0-0). A survey and criticism of the economic views of the New Left radicalism. Prerequisites: ECON 201/202 or 306/307 or 304.

ECON 405. *Computer Applications in Economics.* ★3 (either term, 3-0-0). An introduction to the relationship between economic analysis and modern high speed computers. Topics include computer techniques useful in economics, computerized statistical techniques, and examination of selected economic models of both a mathematical and stochastic nature. Prerequisites: ECON 381/382.

ECON 407. *Introduction to Econometrics I.* ★3 (First Term, 3-0-0). Statistical inference in economics. Topics in statistical theory with emphasis on estimation and tests of hypotheses. The general linear regression model. Prerequisites: ECON 381/382 or equivalent; ECON 395/396 or equivalent; MATH 202/221 or equivalent.

ECON 408. *Introduction to Econometrics II.* ★3 (Second Term, 3-0-0). Econometric problems and techniques with emphasis on regression models. Single equation techniques and introduction to simultaneous equation systems. Applications in research projects. Prerequisite: ECON 407 or equivalent.

ECON 418. *Canadian Economic Development.* ★3 (either term, 3-0-0). Introduction to "new economic history," emphasizing the methodology of quantitative economic history research. Prerequisite: ECON 381 and 318 or 318 or consent of the Department.

ECON 421. *International Trade.* ★3 (First Term, 3-0-0). Nature and relevance of international trade; early trade doctrines; the theory of comparative advantage, classical and modern approaches and empirical evidence for them; new approaches to the pure theory of international trade; economic growth and international trade; market imperfections and trade; commercial policy; economic integration and the gains from trade. Prerequisites: ECON 381/382.

ECON 422. *International Economics.* ★3 (Second Term, 3-0-0). An analysis of short and long term capital movements, direct foreign investment in Canada, the foreign exchange market, balance of payments problems, international adjustment mechanisms and monetary arrangements. Prerequisites: ECON 381/382.

ECON 431. *Labour Economics.* ★3 (either term, 3-0-0). An advanced treatment of demand for labour, supply of labour, wage differentials, trade union behaviour, and related topics. Prerequisite: ECON 331 and 381, or consent of the Department.

ECON 441. *Monetary Theory and Policy.* ★3 (either term, 3-0-0). The significance of price level changes; classical and Keynesian macro-economics models; theory of demand for money; theory of money supply; monetary policy. Prerequisite: ECON 382 or consent of the Department.

ECON 451. *Resource Allocation Within the Public Sector of the Canadian Economy.* ★3 (either term, 3-0-0). An examination of basic economic principles and concepts which are utilized in allocating resources in the public sector of the Canadian economy. Prerequisites: ECON 351/352 or consent of the Department.

ECON 471. *Industrial Organization I.* ★3 (First Term, 3-0-0). Contemporary industrial structure; minimum efficient size of firms; business concentration; related topics, e.g., foreign investment in the Canadian economy and barriers to new competition. Prerequisite: ECON 381 or consent of the Department.

ECON 472. *Industrial Organization II.* ★3 (Second Term, 3-0-0). The behavior of firms in different market structures and the attendant economic performance. The development and administration of an effective competition policy; problems of law enforcement; adequate measures to deal with specific market elements, e.g., price fixing, predatory pricing, mergers, misleading advertising. Prerequisite: ECON 381 and ECON 373 or 471 or MANEC 312.

ECON 473. *Economics of Non-Market Activities.* ★3 (either term, 3-0-0). The application of economic analysis to such topics as crime, marriage, fertility and representative government. Prerequisites: ECON 201/202 and consent of the Department.

ECON 481. *Micro-Economic Analysis II.* ★3 (either term, 3-0-0). Theory of distribution; general equilibrium analysis; welfare economics. Prerequisite: ECON 381.

ECON 482. *Macro-Economic Analysis II.* ★3 (either term, 3-0-0). Inflation, employment, and macro-economic policy; business cycles and theories of economic growth; macro-economic forecasting and econometric models. Prerequisite: ECON 382.

54.9 English

Department of English

NOTE: FOR A COMPLETE LISTING OF ENGLISH COURSES OFFERED SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

ENGL 200. *A Survey of English Literature from the Middle Ages to the Twentieth Century.* ★6 (3-0-0). A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ENGL 210. *English Literary Forms.* ★6 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

ENGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0). A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English Literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265.

ENGL 270. *Readings in Poetry.* ★3 (either term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry. Prerequisite: ENGL 215.

ENGL 275. *Readings in Prose.* ★3 (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically. Prerequisite: ENGL 215.

ENGL 284. *Canadian Literature in Process.* ★3 (either term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English. Prerequisite: ENGL 215.

ENGL 290. *The Craft of Writing.* ★3 (Second Term, 3-0-0). A study of techniques of expository writing, intended to increase awareness of the resources of English prose, and to provide intensive practice in using these. Prerequisites: ENGL 215, any single-term course in English and consent of the Department.

54.10 Finance

FIN 304. *Business Finance.* ★3 (either term, 3-0-0). Introduction to financial decision-making. Prerequisites: ACCTG 204, MANEC 323, MGTSC 307, 357.

FIN 401. *Risk Management.* ★3 (Second Term, 3-0-0). Nature of risk and uncertainty and methods of managing risk; new approaches and empirical evidence. Prerequisite: FIN 304.

FIN 411. *Investment Principles: Security Analysis.* ★3 (either term, 3-0-0). Theories of investment with special reference to types of securities, prices, and market operation. Analytical techniques in the selection of securities. Prerequisite: FIN 304.

FIN 415. *International Financial Markets.* ★3 (either term, 3-0-0). An overview of the international financial environment and the financial function in the multi-national corporation. Its purpose is to provide decision-making skills in international money and capital markets. Prerequisite: FIN 304.

FIN 430. *Selected Topics in Finance.* ★3 (Second term, 3-0-0). Prerequisite: FIN 304 and consent of instructor.

FIN 431. *Advanced Portfolio Management.* ★3 (either term, 3-0-0). Recent developments in capital market theory, option pricing models, empirical studies, and the implications of theoretical developments for investment planning and evaluation of investment performance. Prerequisite: FIN 411.

FIN 432. *Capital Investment.* ★3 (either term, 3-0-0). Capital budgeting and the determination of the cost of capital to the firm. Prerequisites: FIN 304 or consent of instructor.

FIN 433. *Advanced Corporate Finance.* ★3 (either term, 3-0-0). Demand and cost estimation for the firm. Efficient asset selection. Growth policy. Financial strategy, including capital structure and dividend policy. Prerequisite: FIN 304.

FIN 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, FIN 446, 447, 448 and 449.)

NOTE: The remaining courses in this section are open to graduate students only.

FIN 456. *Finance.* ★3 (either term, 3-0-0).

FIN 562. *Portfolio Management.* ★3 (First Term, 3-0-0).

FIN 563. *Corporate Financial Planning.* ★3 (Second Term, 3-0-0).

FIN 564. *Risk Management.* ★3 (First Term, 3-0-0).

FIN 565. *Selected Topics in Finance.* ★3 (either term, 3-0-0).

FIN 568. *International Finance.* ★3 (either term, 3-0-0).

FIN 900. *Non-Thesis Project* ★3 (ariable).

54.11 Geography

Department of Geography

NOTE: FOR A COMPLETE LISTING OF GEOGRAPHY COURSES OFFERED SEE § § 44 AND 184 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

GEOG 200. *General Geography.* ★6 (3-0-0). A survey course covering various aspects of Geography, including the physical, human and regional. GEOG 200 may not be offered for credit with any other 200-level course in Geography.

GEOG 230. *Introductory Physical Geography I.* ★3 (either term, 3-0-2). Introduction to geomorphology; the nature and formation of major landform features of the earth's surface. Rock weathering and slope movements. Landforms developed by erosional and depositional processes of rivers, glaciers, winds, waves and currents. A field trip in the Edmonton area may be offered. Laboratory work required.

GEOG 231. *Introductory Physical Geography II.* ★3 (either term, 3-0-2). Introduction to the atmosphere and biosphere. Physical elements of weather and climate. Causes, changes and patterns of weather. Climatic classification. Spatial and dynamic interrelations of climate, soils and vegetation. Laboratory work required. Note: GEOG 230 does not have to precede GEOG 231. The courses may be taken in either order or quite separately from each other.

GEOG 250. *Spatial Organization of Human Activity.* ★3 (either term, 3-0-0). The search for order in man's occupation of the earth and of his distribution across it; maps as techniques for understanding reality.

GEOG 336. *Environment Alberta.* ★3 (either term, 3-0-0). The physical environment of Alberta. Regional variation in the patterns of climate, landforms, water, soils, vegetation and wildlife; the geographic synthesis of these patterns to give a broad understanding and appreciation of the province and its environmental problems.

GEOG 350. *Introduction to Economic Geography.* ★3 (either term, 3-0-0). Analysis of the locational characteristics of economic activities throughout the world. The significance of location and spatial arrangement with respect to the relationships between geography and economics. Prerequisite: GEOG 250 or a course in economics.

GEOG 359. *Introduction to Behavioral Geography.* ★3 (Second Term, 3-0-0). Decision making in a spatial context. Response to perceived social and physical environment.

GEOG 360. *Geography of Rural Canada.* ★3 (First Term, 3-0-0). The physical environment and the development of rural Canada; physical limits and economic margins; agricultural and rural development; the future for rural Canada.

GEOG 364. *The Influence of Man on the Natural Environment.* ★3 (either term, 3-0-0). Introduction to basic concepts necessary for a general understanding of processes whereby man initiates environmental change, intentionally and unintentionally.

GEOG 381. *Geography of the City.* ★3 (First Term, 3-0-0). Origin and spread of urban settlement; problems arising from the growth and form of metropolitan areas and inter-city systems.

GEOG 382. *Geography of Urban Canada.* ★3 (Second Term, 3-0-0). Spatial aspects of urban development in Canada with particular reference to current research and literature.

GEOG 400. *North America.* ★6 (3-0-0). The regional geography of Canada and the United States. The physical framework of these countries and its significance in their historical development; the concept of the geographic region, the pattern and characteristics of these regions, with selected detailed studies. Prerequisite: A previous course in geography or consent of the Department.

NOTE: § 54.12 — Reserved.

54.13 History

Department of History

NOTE: FOR A COMPLETE LISTING OF HISTORY COURSES OFFERED, SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

HIST 200. *European History.* ★6 (3-1s-0). The evolution of European society from the decline of the Roman Empire in the West to the present.

HIST 201. *European History since the Renaissance.* ★6 (3-0-0).

HIST 204. *Studies in the Political and Social History of Europe.* ★3 (either term, 3-0-0). A course dealing with four or five particular historical topics from the fall of Rome to 1914 using an integrated text and monograph studies.

HIST 278. *An Introduction to the Study of Canadian History 1500-1867.* ★3 (First Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian History. Note: Formerly HIST 378.

HIST 279. *An Introduction to the Study of Canadian History 1867-1967.* ★3 (Second Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian History. Note: Formerly HIST 379.

HIST 310. *Twentieth Century Europe.* ★6 (3-0-0).

HIST 311. *History of International Relations since 1939.* ★6 (3-0-0).

HIST 339. *Eastern Europe since World War I.* ★3 (either term, 3-0-0). The recent history of Eastern Europe.

HIST 340. *Social and Economic History of Europe.* ★6 (3-0-0).

HIST 359. *Eastern Europe in the Nineteenth Century.* ★3. (either term, 3-0-0). History of the area, from the Napoleonic War to World War I; the Polish question; the evolution of the Habsburg Empire; formation of nation-states in the Balkans.

HIST 364. *History of American Economic Life.* ★3 (either term, 3-0-0). A survey of American economic problems and policies in their historical setting.

HIST 370. *Topics in the Social and Intellectual History of English Canada Since 1760.* ★3 (either term, 3-0-0). A survey of the major themes in English-Canadian social and intellectual history. Prerequisites: HIST 278/279 or consent of the Depart ment.

HIST 374. *French Canada to Confederation.* ★3 (either term, 3-0-0).

HIST 375. *French Canada since Confederation.* ★3 (either term, 3-0-0).

HIST 376. *History of Canada Since 1914.* ★3 (either term, 3-0-0).

HIST 377. *Topics in the History of Canadian External Relations.* ★3 (either term, 3-0-0). A survey of the impact of the United States and Great Britain on Canadian development.

HIST 392. *Modern Latin America.* ★3 (either term, 3-0-0). A survey of Latin American history since 1810. Note: Formerly part of HIST 390.

HIST 395. *History of Science and Technology.* ★6 (3-0-0). The nature of science and technology. The scientific process, the origins of the scientific tradition and the emergence of science. The scientific and industrial revolutions; discovery and invention in response to intellectual, social, political and commercial needs and pressures. The evolution of the major scientific disciplines and of technology from antiquity to the present; the interdependence of science and technology through the ages; the natural and social sciences in our time; prediction of possible future trends.

HIST 464. *Topics in the History of American Economic Life.* ★3 (either term, 0-3s-0). A seminar on selected problems in American economic history.

54.14 Industrial Relations

IND R 304. *Industrial Relations in Canada.* ★3 (either term, 3-0-0). Union, management and government participation in the Canadian industrial relations system. It examines the nature, causes and possible methods of settling labor disputes and processing grievances. It gives the student a chance to participate in simulated negotiations of collective agreements.

IND R 401. *Labor Relations Law and Legislation.* ★3 (First Term, 3-0-0). An examination of the legal framework within which collective bargaining takes place in Canada.

IND R 411. *Collective Bargaining.* ★3 (First Term, 3-0-0). A comprehensive study of collective bargaining including the theories of bargaining, negotiating techniques and the implications of collective bargaining for public policy. This course examines the historic and contemporary problems which have affected the development of the Canadian Labor Movement and Canadian Public Policy. Prerequisite: IND R 304 or consent of instructor.

IND R 412. *Administration of Agreements.* ★3 (Second Term, 3-0-0). A detailed analysis examining the scope of collective bargaining; the day-to-day administration of those agreements and the problems of dealing with industrial conflict. Prerequisite: IND R 411 or consent of instructor.

IND R 413. *Employee Benefits in Canada.* ★3 (First Term, 3-0-0). The union, management, and government response to a wide range of employee benefits and social security. The characteristics, rationale, deficiencies, and costs of these programs will be studied. This course is offered to both business and non-business students.

IND R 414. *Comparative Industrial Relations Systems.* ★3 (Second Term, 3-0-0). This course examines the economic, political and social philosophy of the industrial relations systems of several countries in various stages of industrialization. Prerequisite: IND R 304 or consent of instructor.

IND R 415. *Development and Utilization of Manpower Resources in Canada.* ★3 (either term, 3-0-0). This course recognizes Canada's need to develop its human resources. Concern is expressed over the structural impact on Canada's human resource needs of such developments as technological change and shifts within the industrial sector. Attention is given to those institutional pressures which influence the type of labor available in Canada. Specific analysis is made of the Government's influence through its manpower programs such as apprenticeship, vocational training and the Canada Manpower Centre. Similarly the trade union's influence is examined through its policies and activities such as the closed shop and jurisdictional restrictions. In such settings, management's strategy is outlined and discussed as it relates to management's policies regarding plant location and expansion, technological innovation, hiring, training and retraining, etc.

IND R 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, IND R 446, 447, 448 and 449.)

NOTE: The remaining courses in this section are open to graduate students only.

IND R 471. *Unions, Managements, and the Public.* ★3 (either term, 3-0-0).

IND R 563. *Labor Relations.* ★3 (First Term, 3-0-0). An advanced study of collective bargaining including the theories of bargaining, negotiating techniques and the implications of public policy for collective bargaining. The seminar provides an opportunity for participation in simulated mediation of labor disputes. This course is not available to students who have taken IND R 411. Prerequisite: IND R 471 or equivalent.

IND R 564. *Collective Agreement Administration and Arbitration.* ★3 (Second Term, 3-0-0). Examines the philosophy and the mechanics of the third party intervention in industrial disputes. Evaluates the feasibility of dispute settlement methods in Canada, ranging from voluntary interest arbitration to compulsory rights arbitration. The seminar provides an opportunity for participating in simulated arbitration. Prerequisite: IND R 471 or equivalent.

IND R 900. *Non-Thesis Project.* ★3 (variable).

54.15 Legal Relations

LEG R 310. *Commercial Law.* ★3 (either term, 3-0-0). An introduction to the Canadian legal system with emphasis on legal problems in commercial law.

LEG R 411. *Law of Business Organizations.* ★3 (either term, 3-0-0). An introduction to the role of the corporation in the business and commercial life of Canada and Alberta, with emphasis on the small private company. Topics include characteristics of corporate existence, process of incorporation, forming a private company, relationship with third parties, distinction between management and ownership, duties of directors and officers, and shareholder rights. Prerequisite: LEG R 310 or consent of instructor.

LEG R 412. *The Legal Regulation of Business.* ★3 (either term, 3-0-0). An examination of the principles of law that underlie the administrative regulation of business by governmental agencies. A representative agency from each of the three levels of government will be analysed to determine how it is created, what powers it possesses, how it uses its powers and how its powers are constrained. Prerequisite: LEG R 310 or consent of instructor.

LEG R 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, LEG R 446, 447, 448 and 449.)

NOTE: The remaining courses are open to graduate students only.

LEG R 519. *Tax Factors in Business Decision Making.* ★3 (either term, 3-0-0).

LEG R 570. *Law, Public Policy and the Canadian Managerial Environment.* ★3 (either term, 3-0-0).

LEG R 571. *Seminar on Products Liability and Consumer Protection.* ★3 (either term, 3-0-0).

LEG R 900. *Non-Thesis Project.* ★3 (variable.)

54.16 Managerial Economics

MANEC 312. *Government and Business.* ★3 (either term, 3-0-0). An analysis of the structure, conduct, and performance of industry. An examination of competition policy in Canada. Prerequisite: MANEC 323 or consent of instructor. Credit will not be given for both MANEC 312 and ECON 373.

MANEC 323. *Business Economics.* ★3 (either term, 3-0-0). Intermediate micro-economics with business applications. The theory of consumer behavior, price and output

determinations under various forms of competition; the allocation of resources; welfare economics. Prerequisites: ECON 201/202, and MATH 240. Credit will not be given for both MANEC 323 and ECON 381.

MANEC 333. *Aggregate Income Analysis.* ★3 (either term, 3-0-0). The theoretical examination of the determinants of national income. Ways in which governments, consumers, and investors combine to determine income, employment growth, and stability. Prerequisites: ECON 201/202. Credit will not be given for both MANEC 333 and ECON 382.

MANEC 409. *Canadian Business History.* ★3 (either term, 3-0-0). The development of the Canadian business system. Special attention is given to the environmental and technological forces that gave shape to the growth of Canada and how these have influenced the character and organizational structure of business.

MANEC 411. *International Business.* ★3 (either term, 3-0-0). A course to acquaint students with the problems and opportunities arising when a firm operates in more than one country: the choice between operating abroad, export and licensing, the nature and causes of the emergence of new capital markets, international institutions facilitating export finance, commodity price stabilization programmes, the implications of commercial, tax and integration policy for business decisions, aspects of international management such as hedging of foreign exchange risk, transfer pricing and choice of optimal capital structure. Prerequisite: MANEC 312.

MANEC 421. *Taxation and Estate Planning.* ★3 (either term, 3-0-0). An examination of the Canadian tax structure from economic, legal, and administrative points of view.

MANEC 441. *Economic Problems.* ★3 (either term, 3-0-0). Current economic problems in business.

MANEC 442. *The Energy Industry, Public Utilities, and Regulation.* ★3 (either term, 3-0-0). A theoretical and empirical examination of the determinants of energy supply and demand. Problems in pricing and regulation of energy industries and public utilities are analyzed. Canadian Federal and Provincial policies are reviewed in depth. Prerequisite: MANEC 312.

MANEC 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, MANEC 446, 447, 448 and 449.)

MANEC 450. *Urban Economics.* ★3 (either term, 3-0-0). The economic characteristics of real property, the fundamentals of urban growth. Prerequisite: MANEC 323 and 333, or consent of instructor.

NOTE: The following courses are open to graduate students only.

MANEC 463. *Managerial Economics.* ★3 (First Term, 3-0-0).

MANEC 464. *Aggregate Income Analysis.* ★3 (either term, 3-0-0).

MANEC 550. *Pricing.* ★3 (either term, 3-0-0).

MANEC 551. *The Managerial Impact of Regulatory Development.* ★3 (either term, 3-0-0).

MANEC 552. *Government Intervention in Business Management.* ★3 (either term, 3-0-0).

MANEC 555. *Transportation Management.* ★3 (either term, 3-0-0).

MANEC 556. *Urban Management.* ★3 (either term, 3-0-0).

MANEC 567. *Selected Topics in Managerial Economics.* ★3 (Second Term, 3-0-0).

MANEC 569. *Energy Industry Policy.* ★3 (either term, 3-0-0).

MANEC 900. *Non-Thesis Project.* ★3 (variable).

NOTE: § 54.17—Reserved.

54.18 Management Science

MGTSC 306. *Probability and Statistics for Business Part I.* ★3 (First Term, 3-0-0). Introduction to probability; discrete and continuous random variables and probability distributions; expectation and variance; normal and binomial distributions; sampling; and sampling distributions for means and proportions; confidence intervals and tests of hypotheses for means and proportions; Bayesian decision theory. Prerequisite: MATH 240.

MGTSC 307. *Probability and Statistics for Business Part II.* ★3 (Second Term, 3-0-0). Statistical inference for the variance; statistical inference for the means, proportions and variances from two populations; analysis of variance; non-parametric statistics; joint probability distributions; marginal and conditional distributions; covariance, correlation and independence; contingency tables; simple linear regression, multiple linear regression, nonlinear regression, and time series analysis. Prerequisites: MGTSC 306; MATH 243.

MGTSC 356. *Introduction to Management Science (Operations Research).* ★3 (either term, 3-0-0). A problem-solving course designed to introduce the student to management science. The following topics are usually covered; history and overview of managment sciences; linear programming including formulation of linear problems, simplex programming solution techniques, and sensitivity analysis; transportation and other network algorithms. Prerequisites: MATH 243, MGTSC 306, 357.

MGTSC 357. *Introduction to Computing for Business Application.* ★3 (either term, 2-1s-0). Introduction to programming using a higher level language such as FORTRAN, and to computer-oriented systems and associated equipment. Access to program libraries. Introduction to simulation. An emphasis is put on information control functions of the management decision-making process.

MGTSC 406. *Business Data Processing.* ★3 (First Term, 3-0-0). This course will include detailed study of business data structure; design and management of large data bases; sorting and merging techniques; file management by COBOL and PL/1; information retrieval; data base management languages; design of an on-line data processing system; case studies. Prerequisite: MGTSC 357 or equivalent. Students registered with the Department of Computing Science are required to have the consent of the Chairman of the Department of Finance and Management Science.

MGTSC 407. *Simulation and Computer Modelling Techniques in Management.* ★3 (Second Term, 3-0-0). This course will include basic concepts of Monte Carlo simulation; simulation of management systems using GPSS and SIMSCRIPT; other simulation languages; design of on-line interactive models in marketing, finance, accounting, and other functional areas; case studies. Prerequisite: MGTSC 357. Students registered with the Department of Computing Science are required to have the consent of the Chairman of the Department of Finance and Management Science.

MGTSC 410. *Advanced Topics in Management Science.* ★3 (First Term, 3-0-0). Advanced mathematical programming including problems of sub-optimization, the decomposition principle, integer programming, optimal search techniques, quadratic programming, general non-linear programming and dynamic programming. Prerequisites: MGTSC 356.

MGTSC 411. *Operations Research in the Private and Public Sectors.* ★3 (Second Term, 3-0-0). Management science and operations research models applied to real operating systems. This course will present case studies illustrating all aspects of the application of quantitative models to actual problems. Modelling the system and interpreting the results will be stressed as opposed to developing solution techniques. Areas of application may include: marketing, finance, urban problems, health care delivery, and crime prevention. Prerequisites: MGTSC 356 and 412.

MGTSC 412. *Stochastic Systems.* ★3 (Second Term, 3-0-0). A course in modelling and optimizing probabilistic time-varying systems such as airport operations, traffic flow, hospitals, production processes, and consumer purchasing behavior. The following topics are covered: Markov processes, queueing models; dynamic programming; policy iteration; inventory theory; simulation. Prerequisites: MATH 243, MGTSC 306 and 357.

MGTSC 415. *Decision Analysis.* ★3 (Second Term, 3-0-0). Analysis of decision-making under uncertainty. This includes single-person decision theory (Bayesian analysis); group decision theory, risk-sharing, and the theory of syndicates; and competitive game theory. The course seeks to develop a framework for rational behavior in the face of uncertainty. Prerequisite: MGTSC 307.

MGTSC 417. *Multivariate Statistical Methods in Business.* ★3 (either term, 3-0-0). Estimation techniques for statistical models relating large sets of variables. Emphasis on application of techniques to examples from functional areas of business. Models discussed may include multiple regression, multiple and partial correlation, analysis of variance, canonical

correlation, discriminant analysis, principal components, factor analysis, cluster analysis, multi-dimensional scaling, and path analysis. Prerequisite: MGTSC 307.

MGTSC 419. *Statistical Models in Business.* ★3 (either term, 3-0-0). Estimation techniques for various types of statistical models. Emphasis on application of techniques to examples from the functional areas of business. Models may include multiple regression, lagged models; models with autocorrelated errors; simultaneous equations; time series models; exponential smoothing; input-output models. Prerequisites: MGTSC 307.

MGTSC 431. *Production Management.* ★3 (First Term, 3-0-0). A systems oriented view of the production management field. Analytical tools available to the production manager and their relationship to the performance of the total system. (Typical topics: Statistical control, scheduling, assembly line balancing, simulation). Prerequisite: MGTSC 356 or equivalent.

MGTSC 432. *Advanced Production Management.* ★3 (Second Term, 3-0-0). Further development of topics introduced in MGTSC 431. Prerequisite: MGTSC 431 or equivalent.

MGTSC 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, MGTSC 446, 447, 448 and 449.)

NOTE: The remaining courses in this section are open to graduate students only.

MGTSC 459. *Quantitative Decision Analysis Under Uncertainty.* ★3 (either term, 3-0-0).

MGTSC 461. *Management Science.* ★3 (Second Term, 3-0-0).

MGTSC 462. *Statistical Inference in Business.* ★3 (Second Term, 3-0-0).

MGTSC 500. *Seminar in Quantitative Methods in Business I.* ★3 (First Term, 3-0-0).

MGTSC 501. *Seminar in Quantitative Methods in Business II.* ★3 (Second Term, 3-0-0).

MGTSC 503. *Production and Operations Management.* ★3 (First Term, 3-0-0).

MGTSC 504. *Applied Time Series Analysis.* ★3 (First Term, 3-0-0).

MGTSC 520. *Multivariate Statistical Methods in Business.* ★3 (Second Term, 3-0-0).

MGTSC 900. *Non-Thesis Project.* ★3 (variable).

54.19 Marketing

MARK 304. *Fundamentals of Marketing.* ★3 (either term, 3-0-0). The evaluation of marketing in the economy. Marketing structure, organization and behavior; marketing functions. Prerequisites: ACCTG 204, LEG R 310, MANEC 323, 333, MGTSC 307, 357, and ORG T 303 and 305; or by consent of the Chairman of the Department of Marketing and Economic Analysis.

MARK 402. *Marketing Research.* ★3 (either term, 3-0-0). Nature and significance of marketing research. Marketing research methods; investigation and analysis of specific research problems. Prerequisite: MARK 304 or consent of instructor.

MARK 403. *Communication Processes in Marketing.* ★3 (either term, 3-0-0). Basic concepts and functions of advertising and communication in the economy; consumer motivation; measurement of communication effectiveness. Prerequisite: MARK 304 or consent of instructor.

MARK 405. *Quantitative Techniques in Marketing Analysis.* ★3 (Second Term, 3-0-0). Mathematical concepts and techniques that can be utilized in the analysis and solution of marketing management problems. Prerequisite: MARK 304 or consent of instructor.

MARK 407. *Marketing Management.* ★3 (either term, 3-0-0). Product and price policies, management of the marketing organization. Emphasis on case analysis of marketing programs, plus readings in the literature. Prerequisite: MARK 304 and at least one of MARK 403, 414 and 418.

MARK 408. *Marketing Decision Simulation.* ★3 (either term, 3-0-0). Marketing decision-making in a dynamic simulated environment. Emphasis on a computerized marketing decision game, plus readings in the literature. Prerequisites: MARK 304. Also MARK 405 or consent of the instructor.

MARK 411. *Marketing Policies and Problems.* ★3 (either term, 3-0-0). Special topics in marketing, to be announced in advance by the instructor. Prerequisite: MARK 304 or consent of instructor.

MARK 414. *Channel Management.* ★3 (either term, 3-0-0). Marketing organization at the retail and wholesale levels of the marketing channel. Specialization and integration of marketing organization; emphasis on systems analysis. Problems in physical distribution and transportation. Prerequisite: MARK 304 or consent of instructor.

MARK 418. *Psychological-Sociological Approaches to Marketing.* ★3 (either term, 3-0-0). Application of the behavioral sciences to analysis of the internal and external environments of marketing; analysis of consumer motivation; comprehensive models of consumer behavior; emphasis on concepts and empirical research. Prerequisite: MARK 304 or consent of instructor.

MARK 419. *Seminar in International Business.* ★3 (Second Term, 3-0-0). Tools of international economy theory applicable to problems in international business; commercial and financial policies for the multi-national firm in industrial and developing countries. Prerequisite: MARK 304 or consent of instructor.

MARK 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, MARK 446, 447, 448 and 449.)

NOTE: The remaining courses in this section are open to graduate students only.

MARK 458. *Marketing Management.* ★3 (either term, 3-0-0).

MARK 561. *Marketing Research.* ★3 (either term, 3-0-0).

MARK 564. *Consumer Behavior.* ★3 (First Term, 3-0-0).

MARK 565. *Quantitative Marketing Management.* ★3 (Second Term, 3-0-0).

MARK 566. *Marketing Public Programs.* ★3 (either term, 3-0-0).

MARK 567. *Communication Processes in Marketing.* ★3 (either term, 3-0-0).

MARK 569. *Product Management.* ★3 (either term, 3-0-0).

MARK 570. *International Marketing.* ★3 (either term, 3-0-0).

MARK 900. *Non-Thesis Project.* ★3 (variable).

54.20 Mathematics

Department of Mathematics

NOTE: FOR A COMPLETE LISTING OF MATHEMATICS COURSES OFFERED SEE § 184 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

MATH 202. *Elementary Calculus I.* ★3 (First Term, 3-0-1). Review of analytic geometry, differentiation and integration of simple functions, applications. Prerequisite: Mathematics 30 or equivalent. Note: Those students who have no knowledge of trigonometry are required to take MATH 101 concurrently. This course may not be taken for credit if credit has already been obtained in any of MATH 203, 207, 212, or 245.

MATH 203. *Elementary Calculus I.* ★3 (either term, 3-0-0). This course description is the same as for Mathematics 202. Prerequisite: Mathematics 30; Mathematics 31, (calculus sequence), or equivalent. Students with low grades in high school calculus should take MATH 202. Note: This course may not be taken for credit if credit has been obtained already in any of MATH 202, 207, 212, or 245.

MATH 204. *Elementary Calculus II.* ★3 (either term, 3-0-0). Differentiation and integration of trigonometric, exponential and logarithmic functions. Intermediate forms and improper integrals. Techniques of integration. Applications. Prerequisite: MATH 202 or 203, or 245 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 208 or 213.

MATH 240. *Algebra and Elementary Calculus I.* ★3 (either term, 4-0-0). Differential and integral calculus of algebraic, exponential, and logarithmic functions, with applications to problems in business and economics. Prerequisite: Mathematics 30 or equivalent. Note: This course is primarily intended for students registered in the faculties of Business Administration

and Commerce, Agriculture and Forestry, and Pharmacy and Pharmaceutical Sciences. This course may not be taken for credit if credit has already been received in any of MATH 202, 203, 207 or 212. Students who have taken Mathematics 31 should take MATH 242.

MATH 242. *Algebra and Elementary Calculus I.* ★3 (either term, 3-0-0). This course covers the same material as MATH 240. Prerequisite: Mathematics 30 and 31 or equivalent.

MATH 243. *Linear Algebra.* ★3 (either term, 3-0-0). Vector and matrix notation, solving linear equations, vector spaces, matrix algebra, determinants, and applications to economics and commerce, including linear programming, marketing problems, and input-output analysis. Prerequisite: Mathematics 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of the following: MATH 274, 278, 312, 381. This course is required for all students in Business Administration and Commerce.

MATH 245. *Elementary Calculus II.* ★3 (Second Term, 3-0-0). Properties and calculus of trigonometric functions, implicit differentiation, partial differentiation, integral tables. Prerequisite: MATH 240 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 202, 203, 207 or 212.

MATH 251. *Mathematics of Finance I.* ★3 (First Term, 3-0-0). Simple and compound interest; force of interest; applications. Certain annuities, simple and general. Perpetuities. Prerequisites: Mathematics 30.

MATH 252. *Mathematics of Finance II.* ★3 (Second Term, 3-0-0). Applications of interest; amortizations, sinking funds, depreciation, depletion, bonds and stocks. Investments. Cash flow analysis. Income tax considerations. Prerequisite: MATH 251.

MATH 302. *Intermediate Calculus I.* ★3 (either term, 3-0-0). Vectors in space geometry, determinants, Cramer's rule, complex numbers, partial differentiation, multiple integration. Prerequisite: MATH 204 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 307 or 314.

MATH 303. *Intermediate Calculus II.* ★3 (either term, 3-0-0). Infinite series, elements of linear differential equations, curves and tangent vectors, polar, cylindrical, and spherical coordinates, arc length and surface area. Prerequisite: MATH 302 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 308

MATH 351. *Life Annuities and Life Insurance I.* ★3 (First Term, 3-0-0). Compound interest review. Elements of probability and application to life contingencies. Construction of the mortality table. Types of life annuities and life insurance. Net premiums. Prerequisite: A statistics course, MATH 204 and MATH 341.

MATH 352. *Life Annuities and Life Insurance II.* ★3 (Second Term, 3-0-0). Net and gross premiums. Reserves, net level and modified. Options, surrender values. Distribution of surplus. Group insurance. Pension plans. Prerequisite: MATH 351.

54.21 Organizational Analysis

NOTE: The following courses are open to graduate students only.

ORG A 470. *The Individual in Groups and Organizations.* ★3 (either term, 3-0-0).

ORG A 472. *Organization Theory and Administrative Practice.* ★3 (either term, 3-0-0).

ORG A 552. *Selected Topics in Behavioral Sciences.* ★3 (either term, 3-0-0).

ORG A 557. *Advanced Seminar in Personality and Organizations.* ★3 (either term, 3-0-0).

ORG A 558. *Advanced Seminar in Theories of Organizations.* ★3 (either term, 3-0-0).

ORG A 565. *Seminar in Personnel Administration.* ★3 (either term, 3-0-0).

ORG A 598. *Seminar in the Management of Complex Organizations.* ★3 (either term, 3-0-0).

ORG A 900. *Non-Thesis Project* ★3 (variable).

54.22 Organization Theory

ORG T 303. *Behavior in Organizations.* ★3 (either term, 3-0-0). Examines the sociological and psychological bases of individual behavior in organizations. Topics of individual psychology examined will include cognition, perception, attitude formation and change, personality structure and change, and motivation. The course will also investigate the behavior of individuals in groups and organizations. In this context various aspects of group dynamics such as leadership, communication, interpersonal sensitivity, morale and satisfaction, and the formation and attainment of individual and group goals will be discussed.

ORG T 305. *Theory of Formal Organizations.* ★3 (either term, 3-0-0). An examination of the structural and functional imperatives of formal organizations. Formation, structure, and change in complex organizations including bureaucratic, matrix, and process-oriented types of organizational designs. Power, authority, and legitimacy variables are examined using anthropological and sociological methodological constructs.

ORG T 421. *Theory and Practice of Personnel Administration I.* ★3 (either term, 3-0-0). Philosophy and procedures in obtaining and maintaining an efficient work force with emphasis on the methods of initiating and carrying out an effective manpower management program. Includes recruitment, selection, utilization, and development of human resources. Prerequisite: ORG T 303 and 305, or equivalent.

ORG T 422. *Theory and Practice of Personnel Administration II.* ★3 (Second Term, 3-0-0). Focus on the development and administration of programs for job analysis; job evaluation; wage surveys; wage and salary systems and administration; performance standards; performance analysis and evaluation; employee services and fringe benefits. Prerequisite: ORG T 421.

ORG T 430. *Seminar in Advanced Theories of Behavior in Organizations.* ★3 (either term, 3-0-0). The same general areas will be covered as in Organization Theory 303. However, the coverage will be in-depth and the seminar format will be utilized in order to develop a maximal interchange of ideas between instructor and student. Prerequisite: ORG T 303.

ORG T 440. *Seminar in Advanced Concepts of Formal Organization Theory.* ★3 (either term, 3-0-0). An analysis of the philosophical and empirical bases of organization theory. The implications of bureaucratic dysfunctions, structural modifications, scientific management concepts and industrial humanism. Critical issues in adapting traditional organization structures to technological and societal changes will be explored. Prerequisite: ORG T 305.

ORG T 441. *Selected topics in Organization Theory and Behavior.* ★3 (either term, 3-0-0). Topics dealt with in this seminar may vary from year to year, and will be chosen at the discretion of the instructor. Prerequisite: Consent of the instructor.

ORG T 445. *Individual Research Projects.* ★3 (either term, 3-0-0). Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, ORG T 446, 447, 448 and 449.)

54.23 Philosophy

Department of Philosophy

NOTE: FOR A COMPLETE LISTING OF PHILOSOPHY COURSES, SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTE SAINT-JEAN CALENDAR.

PHIL 221. *Practical Logic.* ★3 (either term, 3-0-0). Elementary methods and principles for distinguishing correct and incorrect reasoning. Topics may include informal fallacies, introduction to scientific method, elementary formal logic, rational decision procedures, the analysis of arguments.

PHIL 250. *Introduction to Logic.* ★6 (3-0-0). The concepts and techniques of modern logic, with emphasis on sentential and predicate logic. Other topics include critiques of non-deductive techniques, non-formal elements in arguments, traditional analysis of arguments, and philosophical logic.

Note: Philosophy 250 presupposes little familiarity with symbolic notation and techniques. Students who already have such familiarity from their work in other disciplines should take PHIL 390/391 instead.

PHIL 390. *Symbolic Logic I.* ★3 (First Term, 3-0-0). The concepts, techniques and applications of modern symbolic logic. Topics include syntax, semantics, natural deduction systems, axiomatic systems, independence, consistency, completeness. Emphasis is on the sentential calculus. Prerequisite: Experience in the operation of symbolic notation outside of logic, or some previous work in logic.

PHIL 391. *Symbolic Logic II.* ★3 (Second Term, 3-0-0). Topics as in Philosophy 390, but with emphasis on the predicate calculus with identity. Prerequisite: PHIL 390 or consent of the Department.

54.24 Political Science

Department of Political Science

NOTE: FOR A COMPLETE LISTING OF POLITICAL SCIENCE COURSES OFFERED SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

POL S 201. *Introduction to Government.* ★3 (either term, 3-0-0). An introduction to the institutions of Canadian and other democratic governments, considering constitutions, legislatures, executives, the public service, courts, federal and other divisions of government authority and selected topics. Note: Formerly part of POL S 200.

POL S 202. *Introduction to Politics.* ★3 (either term, 3-0-0). An introduction to the process of democratic politics considering power, or influence, democracy, civil liberties and rights, political ideology, public opinion, elections, political parties, interest groups and other selected topics. Note: Formerly part of POL S 200.

POL S 300. *Comperative Political Systems.* ★6 (3-0-0). Comparative analysis of selected major political systems of the present day, with emphasis on the relationships between political functions and social processes. Note: Designed primarily as an introductory course at the senior level.

POL S 310. *History of Political Thought.* ★6 (3-0-0). A historical and critical survey of the development of political and social philosophy from ancient Greece to the present time, with selected readings from major political writers.

POL S 312. *Ethics and Politics.* ★3 (either term, 3-0-0). The relationship between contemporary ethical theory and normative political analysis.

POL S 316. *Mathematical Applications in Political Science.* ★3 (either term, 3-0-0). An introductory examination of current and potential uses of descriptive and inferential statistics, in the study of politics. Prerequisite: Mathematics 30 or equivalent.

POL S 317. *Research Methods and Techniques for Political Analysis.* ★3 (either term, 3-0-0). An examination of basic research methods; techniques for data collection and analysis in political science. Prerequisite: POL S 316 or consent of the Department.

POL S 320. *Canadian National Government and Politics.* ★6 (3-0-0). The structure and function of the government of Canada, especially of the Commons, Senate, Cabinet System, Civil Service, and the role of political parties. Note: Not open to students who have taken POL S 321.

POL S 321. *Canadian Government.* ★3 (either term, 3-0-0). The structure and function of the government of Canada, provincial governments and local governments. Note: Designed primarily for students who want one senior course in Political Science. Not open to students who are taking or have taken POL S 200 or 320.

POL S 322. *Local Government and Administration.* ★3 (either term, 3-0-0). The structure and functions of local government in Canada with primary emphasis on the Province of Alberta. Note: Designed primarily for students who want one senior course in Political Science. Not open to students who are taking or have taken POL S 323.

POL S 324. *Comparative Urban Political Systems.* ★3 (either term, 3-0-0). A comparative survey of the political processes and structural arrangements of several larger metropolitan regions, with emphasis upon those common conditions and problems which require significant policy decisions.

POL S 325. *Topics in City Politics.* ★3 (either term, 3-0-0). A detailed examination of specific municipal policies. Topics will vary annually. Prerequisite: POL S 322, or 323, or 324.

POL S 328. *Elements of Public Administration.* ★3 (either term, 3-0-0). Topics include government organization, budgets, policy-making, and democratic control and accountability. The focus is on Canada, but other countries are also considered.

POL S 376. *Problems of Political Development.* ★3 (either term, 3-0-0). The examination of the common problems of developing nations; political integration, the establishment and maintenance of political order, the role of the military, and the institutionalization of political change.

POL S 380. *Comparative Politics.* ★3 (either term, 3-0-0). An introduction to topics and issues in comparative politics. Note: Formerly POL S 374.

POL S 384. *Government of the United Kingdom.* ★3 (either term, 3-0-0). Its structure and functions, espeically the monarchy, the cabinet system, parliament, the civil service and parties.

POL S 385. *The Development of Western European Politics and Government.* ★3 (either term, 3-0-0). Patterns in the development of political processes and governmental institutions in Western Europe. Note: Formerly part of POL S 383.

POL S 386. *Contemporary Western European Politics.* ★3 (either term, 3-0-0). An examination of similarities and differences in the political and governmental processes of contemporary Western Europe. Note: Formerly part of POL S 383.

POL S 390. *Introduction to Political Behavior.* ★3 (either term, 3-0-0). An introduction to political behavior as exhibited in both the public and private political world of the individual. Note: Formerly a full-session course.

POL S 391. *Political Parties of Canada and Other Western Democracies.* ★3 (either term, 3-0-0). A study of the political parties of Canada in comparison with those of other western democracies. Topics include party systems, ideologies and programs, members and supporters, organization and resources, and electoral and governmental activities. Note: Formerly part of POL S 398.

POL S 392. *Interest Groups of Canada and Other Western Democracies.* ★3 (either term, 3-0-0). A study of political interest groups of Canada in comparison with those of other western democracies. Topics include group ideologies and interests, members, organization and resources, and non-governmental and governmental activities. Note: Formerly part of POL S 398.

POL S 394. *The Study of Socialization to Politics.* ★3 (either term, 3-0-0). Topics covered include political perception, the formation of attitudes, attitude structures and belief systems in political behavior, the learning of "civic" attitudes and their impact on subsequent political behavior.

POL SC 395. *Political Attitudes and Ideologies.* ★3 (either term, 3-0-0). A study of political attitudes and ideologies, and of their impact on the individual citizen's involvement in politics.

POL S 396. *Electoral Behavior.* ★3 (either term, 3-0-0). Analysis of the voting behavior of individuals and social groupings. Content will be cross-national in scope and will deal largely with sociological and institutional influences on voting.

NOTE: § 54.25 — Reserved.

54.26 Psychology

Department of Psychology

NOTE: FOR A COMPLETE LISTING OF PSYCHOLOGY COURSES OFFERED SEE § § 44 AND 184 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

PSYCO 260. *Basic Psychological Processes.* ★3 (First Term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 321. *Psychology Applied to Business and Industry.* ★3 (either term, 3-0-0). Methods and results of psychological studies in such fields as: selection, placement, training and

supervision of personnel; promotion of efficiency and safety in production; advertising, selling and consumer research. Prerequisite: PSYCO 309.

PSYCO 341. *Social Psychology.* ★3 (either term, 3-0-0). Individual and group behavior observed in social processes. Prerequisites: PSYCO 260/261 or equivalent. Note: PSYCO 341 and SOC 341 may not both be taken for credit.

PSYCO 383. *Personality.* ★3 (either term, 3-0-0). An introductory survey including representative theoretical points of view and research relevant to major problems of the study of personality. Prerequisites: PSYCO 260/261 or equivalent.

PSYCO 404. *Contemporary Psychology I.* ★3 (First Term, 3-0-0). A study of theories and trends in present day psychology. Prerequisite: Consent of the Department.

PSYCO 431. *Theory and Practice of Psychometrics.* ★3 (either term, 3-0-3). The nature of psychological tests, with practical work in administration, scoring, and interpretation of tests. Prerequisites: PSYCO 260/261 or equivalent and 309, or consent of the Department.

PSYCO 441. *Experimental Social Psychology.* ★3 (either term, 3-0-2). An intensive study of methods for investigating social behavior. The evaluation of published research, design of experiments, analysis and communication of results will be stressed. Opportunity for supervised research projects. Prerequisites: PSYCO 260/261 or equivalent, PSYCO 309, and one of PSYCO 360, 361, 362, 365, or 366.

54.27 Sociology

Department of Sociology

NOTE: FOR A COMPLETE LISTING OF SOCIOLOGY COURSES OFFERED SEE § 44 OF THE FACULTIES OF ARTS AND SCIENCE CALENDAR AND § 174 OF FACULTÉ SAINT-JEAN CALENDAR.

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analyzed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The process whereby the individual is socialized into society; the sources of conformist and nonconformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 321. *Sociology of Social Problems.* ★3 (either term, 3-0-0). A review of several macro-sociological perspectives focusing on such topics as population, ecology, social and economic inequality, intergroup relations, nationalism, collective violence and the sociology of social intervention. Note: Not available for credit to students with credit in SOC 320, 322, or 324.

SOC 325. *Criminology.* ★3 (either term, 3-0-1). Examination and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior.

SOC 327. *Criminal Justice Administration.* ★3 (either term, 3-0-1). The evolution and evaluation of the theories of punishment, the law, the police and the courts, penal and reformatory institutions, probation and parole, experiments in reform and rehabilitation. Prerequisite: SOC 325.

SOC 341. *Social Psychology.* ★3 (either term, 3-0-1). An introduction to the study of individual and group behavior observed in social processes. Prerequisite: SOC 202 or 403 or PSYCO 260/261 or EDPSY 276. Note: SOC 341 and PSYCO 341 may not both be taken for credit.

SOC 344. *Public Opinion and Mass Communication.* ★3 (either term, 3-0-0). The nature of public opinion; factors involved in its assessment and its formation. The role of the media of mass communication. Prerequisite: SOC 341 or PSYCO 341.

SOC 351. *Population Concerns.* ★3 (either term, 3-0-0). Population trends and problems in Canada and the rest of the world; social and cultural factors underlying fertility, mortality, and migration patterns and differentials; their relationship to the "population explosion", population composition and distribution; basic population methodology; ecological theories and processes; urbanization; population theory and policy.

SOC 352. *Population, Social and Economic Development.* ★3 (either term, 3-0-0). Principles of growth and development in their historical context with regard to developed countries, and in their contemporary context with regard to underdeveloped countries. The interrelationships of economic, social and demographic variables in the process of development. Problems of urbanization and industrialization; factors influencing social change in the modern West and Asia or Latin America or Africa.

SOC 353. *Urban Sociology.* ★3 (either term, 3-0-0). Social implications of the urban life with respect to such topics as patterns of city growth; urban social organization (family, neighborhood, community); urban social issues (housing, crime); urban policy and urban planning (sociology of planning, citizen participation). Prerequisite: SOC 202 or 403 or consent of the Department.

SOC 361. *Social Organization.* ★3 (either term, 3-0-0). Social systems, their components, interrelations, and the bases of social differentiation and integration. Prerequisite: SOC 202.

SOC 363. *Industrial Sociology.* ★3 (either term, 3-0-0). An introduction to the systematic analysis of people at work. Of special interest are the impacts of industrialization on Canadian and other developed societies as well as the intergroup and and interpersonal relations in work settings. Prerequisite: SOC 202 or 403.

SOC 364. *Comparative Institutional Change.* ★3 (either term, 3-0-0). Interrelationships among social institutions (technology, economy class, kinship, power structures, basic value patterns); comparative institutional structures and changes in Canada and other selected societies. Prerequisite: SOC 202 or 403 or consent of the Department.

SOC 371. *The Family.* ★3 (either term, 3-0-0). Structure and function of the family system, historically and cross-culturally. The family system in contemporary societies emphasizing its institutional characteristics and current trends. Prerequisite: SOC 202 or 403.

SOC 403. *Principles of Sociology.* ★3 (either term, 3-0-0). Basic concepts and principles of Sociology for students with advanced standing. Prerequisite: Senior or graduate standing. Note: Designed for third year students and carries no credit for those with SOC 202 credit.

SOC 412. *Methodological Problems in Social Research.* ★3 (Second Term, 3-0-0). The design and evaluation of qualitative and quantitative research strategies in the social sciences. Prerequisite: SOC 311. Note: Formerly SOC 411.

SOC 427. *Juvenile Delinquency.* ★3 (either term, 3-0-1). Juvenile delinquency and its relation to adult crime; the social processes involved in the genesis and perceptions of styles of delinquency and their relationship to the community, and to various current theories of prevention and control, including the role of institutions and law. Prerequisite: SOC 325. Note: Not open to students with credit in SOC 329.

Faculty of Dentistry

66 INTRODUCTORY

66.1 Members of the Faculty

66.1.1 OFFICERS OF THE FACULTY

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Assistant Dean
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Research and Graduate Studies
J. A. HARGREAVES, LDS, MChD, AM

Academic Standing
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Universities Coordinating Council
H. M. DICK, DDS, MSc

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Audiovisual
W. C. MEYER, DDS

Continuing Education
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Patient Management
J. M. CALVERT, DDS

Administrative Officer
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66.1.2 DEPARTMENT OF DENTAL HEALTH CARE

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Lecturer
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L. CROWLEY, Dip D HYG
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L. KOWALCHUK, Dip D HYG
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V. SCALES, Dip D HYG
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†M. P. SUSS, Dip D HYG
H. WAGSTAFF, Dip D HYG
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66.1.3 DEPARTMENT OF RESTORATIVE DENTISTRY

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66.1.4 DEPARTMENT OF STOMATOLOGY

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V. TOOR, DDS
B. WALKER, Dip D HYG
†R. E. WARREN, DDS, Dip Oral Surgery
C. C. YU, DDS, MSc
A. L. YUILL, DDS, Dip Ortho

66.1.5 DEPARTMENT OF ORAL BIOLOGY

Professor and Chairman
J. W. OSBORN, LDS, RCS, BDS, FDS, FCS, PhD

Professors
D. J. CARMICHAEL, BAgrSc, PhD
G. H. SPERBER, BSc, BDS, PhD, MS
N. R. THOMAS, BSc, BDS, PhD

Associate Professors
N. R. DAVIS, BSc, PhD
L. W. KLINE, BSc, MSc, PhD
C. H. PEARSON, BSc, PhD
D. J. WIGGLESWORTH, BDS, PhD, FDS, RCS(E), D Orth

Assistant Professor
P. G. SCOTT, MRC Scholar, BSc, PhD (temporary)

Professors Emeriti
R. V. BLACKMORE, DDS, PhD
K. A. McMURCHY, BA, DDS
J. TUBA, MSc, PhD

†Joint Appointment — Two departments.

66.1.6 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, BA, MEd, EdD

Dean of the Faculty of Medicine
D. F. CAMERON, BA, MD, FRCP(c), FACA

Dean's Designate
K. D. McFADDEN, BA, MA, PhD

Professors
G. O. BAIN, BSc, MD (Pathology)
R. HENDERSON, BSc, MS, PhD (Pharmacology)
T. S. LEESON, BA, MA, MB, B.Chir. MD, PhD (Anatomy)

Associate Professor
S. M. PADSHA, MBBS (Physiology)

Clinical Professor
J. D. M. ALTON, MSc, MD (Plastic Surgery)

Alberta Dental Association Representative
B. P. MARTINELLO, DDS, DDPH, FRCD

Medical Sciences Librarian
P. GODDARD, BA, MA, MLS (non-voting member)

Student Representative
ELECTED ANNUALLY

Registrar (or designate)

66.2 Faculty Objectives

1. To provide an academic and intellectual milieu in a University setting that facilitates all aspects of education and research in dentistry and allied health and scientific fields by:
(a) attracting, selecting, and motivating the most qualified academic and non-acedemic staff.
(b) creating a University environment that emphasizes the quality of life for staff and students.

2. To contribute to the advancement of knowledge in dentistry and allied fields by doing research and publishing research papers, and communicating and interacting with:

(a) other health sciences and other disciplines of the University in order to promote comprehensive health care.
(b) the dental profession, dental auxiliaries, auxiliary-training programs, and the community in order to promote oral health.
(c) basic and clinical science organizations and granting agencies in order to promote disciplinary and inter-disciplinary research.

To graduate competent undergraduate dentistry students and dental hygienists, and graduate and post-graduate students by:

(a) attracting, selecting and then motivating the most suitable and well-qualified students who have the ability to acquire the education and training for a professional and / or academic career.
(b) maintaining an undergraduate dentistry curriculum that integrates basic medical and dental sciences, behaviour and social sciences, dental clinical sciences, community and preventive dentistry, hospital dentistry, and practice management; and incorporates recent concepts, materials, techniques, advances and research in all areas; and reflects the existing and projected provincial, national, and international oral health needs.
(c) maintaining a dental hygiene curriculum that produces a student who will complement the present and future dental-care-delivery system.
(d) maintaining an educational program that allows for the smooth transition from graduation to practice and which ensures that the student is competent to practise in an efficient and responsible manner.
(e) graduating students who are competent to assume a role of leadership and service in their profession and community.

4. To provide the opportunity and stimulus for continued learning through post-graduate, graduate, research and continuing education programs.

5. To provide efficient and quality dental treatment for the community that emphasizes and recognizes the needs of the patient.

66.3 General Information

66.3.1 D.D.S. DEGREE

Dental education was instituted at The University of Alberta in 1917 in the School of Dentistry under the Faculty of Medicine. The first full degree program was offered in 1923, and the first class graduated in 1927. The School became the Faculty of Dentistry in 1944. Dental Auxiliary training was instituted in 1961. In 1962 the School of Dental Hygiene came into being and offered both the Dental Auxiliary and Dental Hygiene programs. A program of graduate studies was formally approved in 1962.

In 1980 the following academic structure was approved:

Department of Dental Health Care
- Division of Community Dentistry
- Division of Dental Hygiene
- Division of General Practice

Department of Oral Biology
- Division of Anatomy
- Division of Biochemistry
- Division of Pathology
- Division of Physiology

Department of Restorative Dentistry
- Division of Biomaterials
- Division of Endodontics
- Division of Fixed Prosthodontics
- Division of Operative Dentistry
- Division of Removable Prosthodontics

Department of Stomatology
- Division of Diagnosis and Oral Radiology
- Division of Oral & Maxillofacial Surgery and Hospital Dentistry
- Division of Orthodontics
- Division of Pedodontics
- Division of Periodontics

Curriculum. The Faculty of Dentistry offers a four-year program of study leading to the degree of Doctor of Dental Surgery (D.D.S.), following satisfactory completion (after senior matriculation) of at least *two* pre-professional years of university education. The pre-professional years provide the necessary background in inorganic chemistry, organic chemistry, biology, physics, the humanities and social sciences.

In the dental curriculum, lecture and laboratory instruction in such fundamental subjects as Anatomy, Physiology, Bacteriology, Histology, General Pathology, Pharmacology, Medicine, Surgery and General Anaesthesia are offered by the respective departments of other faculties. The lectures, laboratories, seminars, and clinics offered by the Faculty of Dentistry relate and integrate these fundamental disciplines with the knowledge, skills, judgment and performance required of the dental practitioner.

In addition to bedside and operating instruction in medicine and surgery, the senior students are assigned to the Dental Department and the Department of General Anaesthesia at the University Hospital. An experience in the Dental Auxiliary Utilization Clinic and in the Mobile Dental Clinic is a requirement in the final year of the program. Thus students are afforded an opportunity to relate their field of health service to the science and art of preventing, curing, or alleviating disease in general.

Information on programs of graduate study and continuing education offered by the Faculty will be found in § § 68.2, 68.4, and 68.5.

Library. The Medical Sciences reading room of the Cameron Library contains a comprehensive selection of reference materials and textbooks on dentistry and related subjects. In addition, it contains most current dental journals in English and other languages, and the *Index to Dental Periodical Literature,* an index to all dental periodicals since 1839.

66.3.2 M.Sc. AND Ph.D. DEGREES

(1) The Faculty of Dentistry has research laboratories and instructional facilities for a limited number of graduate students proceeding to the Master of Science degree in basic science (oral biology). In addition, the Division of Oral Biology offers programs leading to the Doctor of Philosophy degree.

(2) Dental graduates may undertake graduate programs in either oral biology or clinical science. Students without dental qualifications holding a B.Sc. degree in biological or physical science are eligible for graduate study in oral biology. Normally, science students accepted into the Ph.D. program in oral biology will hold the equivalent of a four year (Honors) B.Sc. degree.

(3) The research interests of the staff include: Anatomy — human growth and development, embryonic induction of dental tissues and organs. Biochemistry — structure, crosslinking of collagen and elastin, calcification. Oral Pathology — immunology and oral tumors, pulp capping agents. Physiology — neuromuscular function. Public Health and Community Dentistry —

health care, delivery systems, administration of public health programs. Clinical Dentistry — multi-disciplinary studies in dental caries and periodontal disease, problems in orthodontic diagnosis and treatment. Dental Materials — fluoride, etching of dental porcelain, physical properties of dentin, evaluations of impression material and tooth desensitizing.

(4) Fellowships and Assistantships are available. Applications may be submitted to the Director, Division of Graduate Studies and Research.

(5) More detailed information may be obtained from the Director of Graduate Studies and Research.

66.3.3 D.H. DIPLOMA

The program of study for Dental Hygienists leads to a Dental Hygiene diploma.

The continuing growth of knowledge in the profession of dentistry created a need for an auxiliary capable of working with the dental team in the areas of preventive clinical services and education of the public to the principles and practices of achieving and maintaining oral health. In 1913 Dr. Alfred C. Fones organized the first formal educational program for this auxiliary, called the Dental Hygienist, at Fones' Clinic, Bridgeport, Connecticut, U.S.A. Since that time, Schools of Dental Hygiene have grown to number more than two hundred and seventy (270) on the North American continent and in Europe.

The ever-increasing knowledge in the area of preventive dental services, and the need and demand for such services by the public, creates a demand for Dental Hygienists far in excess of the number now available. The curriculum in the Dental Hygiene Program offers excellent preparation for many opportunities open to Dental Hygienists.

The Dental Hygiene Program is located in the Dentistry-Pharmacy Centre at The University of Alberta. Its programs benefit from the close co-operation and assistance of members of the Faculty of Dentistry and consultants from the office of the Dean of Dentistry. Courses are also offered within the program from the Faculties of Arts, Medicine and Science. The Dental Hygiene laboratories and clinics are equipped with modern facilities and afford the student an opportunity to apply knowledge, skills, and techniques for the improvement of dental health. The services offered in the Dental Hygiene Clinic are available by appointment to students at The University of Alberta and citizens of Edmonton and surrounding districts. Further benefits are derived from the Program's association with the Local Health Units of Alberta, the Dental Clinics at The University of Alberta Hospital and the Alberta Hospital.

The Dental Hygiene Program is approved by the Councils of Dental Education of the Canadian Dental Association and of the American Dental Association. Successful students in the Dental Hygiene Program are encouraged to write the National Board Dental Hygiene Examinations of the American Dental Association.

66.3.4 ORTHODONTICS DIPLOMA

The Faculty of Dentistry offers a postgraduate program designed to prepare dental graduates for specialist certification in orthodontics. Details may be obtained from the Chairman, Graduate Studies and Research, Faculty of Dentistry.

66.4 Registration and Licensing

66.4.1 D.D.S. DEGREE

The Faculty of Dentistry of The University of Alberta is approved by the Canadian Dental Association and the American Dental Association.

Graduates in dentistry from The University of Alberta may register in the Province of Alberta upon payment of a licencing fee without further examination.

Regulations regarding the practise of dentistry in any of the other provinces in Canada may be obtained by writing to the Dental Registrar of that province:

ALBERTA
Alberta Dental Association
#101, 8230-105th Street,
Edmonton, Alberta
T6E 5H9

BRITISH COLUMBIA
College of Dental Surgeons of British Columbia
1125 West 8th Avenue, Vancouver, B.C.
V6H 3N4

MANITOBA
The Manitoba Dental Association
308 Kennedy Street,
Winnipeg, Manitoba
R3B 2M6

NEW BRUNSWICK
New Brunswick Dental Society
440 Champlain Street
Saint John West, New Brunswick
E2M 1R9

NEWFOUNDLAND
Newfoundland Dental Association
203 LeMarchant Road, St. John's,
Newfoundland A1C 2H5

NOVA SCOTIA
Nova Scotia Dental Association
12-5880 Spring Garden Road
Halifax, Nova Scotia
B3H 1Y1

ONTARIO
The Royal College of Dental Surgeons
of Ontario
230 St. George Street,
Toronto, Ontario
M5R 2N5

PRINCE EDWARD ISLAND
Dental Association of Prince Edward Island
239 Water Street
Summerside, P.E.I. C1N 1B4

QUEBEC
Order of Dentists of Quebec
Ste. 303, 801 est, rue Sherbrooke,
Montreal, P.Q. H2L 1K7

SASKATCHEWAN
College of Dental Surgeons of Saskatchewan
Ste. 811, 105-21st Street East
Saskatoon, Saskatchewan S7K 0B3

Graduates of approved Dental Schools are eligible for registration with the National Dental Examining Board of Canada upon submission of an application, dated not later than March 30th of the year of graduation (subject to change). Failure to apply by that date will entail the passing of an examination in order to receive the Certificate. Applications may be obtained from the Dean's office.

Graduates are also eligible to write licencing examinations in most of the states in the United States and the examinations of the National Board of Dental Examiners of the American Dental Association.

The Doctor of Dental Surgery (D.D.S) degree and the Doctor of Dental Medicine (D.M.D.) degree (granted by some Canadian and United States universities) are equivalent degrees.

66.4.2 D.H. DIPLOMA

A diploma from the dental hygiene program does not, in itself, confer the right to practise. A dental hygienist desiring to practise dental hygiene in Canada should consult the appropriate provincial licencing body as listed below:

Alberta — Registrar, Alberta Dental Association, Ste. 101, 8230 - 105 Street, Edmonton, Alberta T6E 5H9.

British Columbia — Registrar, College of Dental Surgeons of British Columbia, 1125 West 8th Avenue, Vancouver, British Columbia V6H 3N4.

Manitoba — Registrar, The Manitoba Dental Association, 308 Kennedy Street, Winnipeg, Manitoba R3B 2M6.

New Brunswick — Registrar, College of Dental Surgeons of New Brunswick, 440 Champlain St., Saint John, N.B. E2M 1R9.

Newfoundland — Registrar, Newfoundland Dental Association, Campbell Building 203 LeMarchant Rd., St. John's, Newfoundland A1C 2H1.

Nova Scotia — Registrar, Provincial Dental Board of Nova Scotia, 1548 Robie Street, Halifax, Nova Scotia B3H 3E6.

Ontario — Registrar-Secretary, Royal College of Dental Surgeons of Ontario, 230 St. George Street, Toronto, Ontario M5R 2P1.

Prince Edward Island — Registrar, The Dental Association of Prince Edward Island, 239 Water St., Summerside, Prince Edward Island C1N 1C1.

Quebec — Registrar, College of Dental Surgeons of the Province of Quebec, 801 Est, Rue Sherbrooke, Montreal, P.Q H2L 1K7.

Saskatchewan — Registrar, The College of Dental Surgeons of Saskatchewan, Suite 811, 105 21st Street East, Saskatoon, Saskatchewan S7K 0B3.

Dental Hygienists are employed at all times under the supervision or direction of a fully qualified dentist.

66.5 Finance

66.5.1 D.D.S. DEGREE

An estimated budget for dental students

	First Year	*Second Year*
Tuition and Fees	$974	$974
Books	440	470
Dental kits	3,000	2,550
Replacements, miscellaneous dental supplies and DUS Fees	135	135
N.B.D.E. (American) Examinations	—	—
N.D.E.B. (Canadian) Examinations	—	—
	Third Year	*Fourth Year*
Tuition and Fees	$974	$974
Books	400	205
Replacements, miscellaneous dental supplies and DUS Fees	260	135
N.B.D.E. (American) Examinations	—	25
N.D.E.B. (Canadian) Examinations	—	200

No student will be allowed to purchase a kit without the permission of the Faculty.

66.5.2 M.SC. AND PH.D. DEGREES

For information regarding graduate program fees, see § 15 of the Faculty of Graduate Studies and Research Calendar.

66.5.3 D.H. DIPLOMA

Approximate Costs

Tuition and Fees	
First year	$680.00
Second year	$680.00
Books	
First year	$350.00
Second year	$300.00
Dental Hygiene Kits	
First year	$400.00
Second year	$300.00

Uniforms—The student will be expected to have a lab coat, one uniform and a pair of white oxfords. The lab coat, uniform and shoes will be purchased under the direction of the Program.

66.5.4 ORTHODONTIC DIPLOMA

For information regarding post-graduate and graduate program fees, contact the Director of Graduate Studies and Research, Faculty of Dentistry.

67 FACULTY REGULATIONS

67.1 Admission

67.1.1 D.D.S. DEGREE

(1) *Academic requirement.* The basic requirement for admission to the Faculty of Dentistry is the satisfactory completion (after senior matriculation) of at least two full years (i.e. ten full courses) of university work including full university courses in organic chemistry, inorganic chemistry, physics and biology. Students completing the pre-professional requirements in either the Faculty of Arts, the Faculty of Science, or Faculté Saint-Jean at The University of Alberta, must include in their programs the following:

1. Chemistry 200, 202 or 302
2. Chemistry 250 or 350
3. Two of Biology 296, 297, 298 or 299

(An applicant not presenting senior matriculation Biology will take Biology 130 during the first year and two of the above-mentioned courses during the second year.)

4. Physics 203 and 207 or Physics 203 and 209
(May be taken only by students who are not presenting Physics at the senior matriculation level.)
or Physics 205 and 207 or Physics 205 and 209
or Physics 242 or Physics 212

The requirement can be met in various patterns in different faculties. Students are urged to take the program that they find most interesting, and that will still give them these prerequisites. For information, the Registrar should be consulted.

Applicants having sequential high school background courses in English, Biology, Chemistry, Mathematics and Physics will best be prepared to succeed in the two year predental program.

(2) *Dental Aptitude Test.* Each applicant will be required to take the *Canadian* Dental Association Aptitude Test. The dental aptitude test is an important component in the selection process. If the test is taken more than once the better set of scores will be used. It is up to each applicant to decide whether or not the test should be re-taken. Tests taken prior to 1975 will not be accepted. Information and application forms are available from the Admissions Office, Faculty of Dentistry.

(3) *Personal Interview.* Although scholarship is a prime criterion, admission cannot be guarateed on the basis of academic standing alone. Before acceptance, an applicant will be interviewed by a team to determine if he/she possesses the personal qualities necessary for the profession. The interview is designed to evaluate an applicant's degree of maturity and motivation, initiative, ability to communicate and personal qualities and interests. Candidates will be advised of the interview dates.

(4) *Final Selection.* Applicant profiles are made up of:

(a) an average of the academic averages
(b) an average of the grades of the required subjects
(c) the dental aptitude scores
(d) the interview scores

Minimum criteria are established for each of the above factors. An applicant who falls below the minimum in any one of the factors will not be considered for admission.

(5) *Residence Requirements.* A minimum of 5% foreign students and 10% non-Alberta Canadians may be accepted providing that no non-resident of Alberta is admitted who is less qualified than any Alberta resident who is denied admission. The remaining 85% may be reserved for Canadian citizens who are residents of Alberta or of the North West Territories or Yukon.

(6) *Application Deadline.* All candidates for admission to the first year of study in the Faculty of Dentistry are required to make application on or before February 1 of the year in which admission is sought. The earliest date for filing such applications is September 30 of the previous year.

(7) *Limitation of Enrollment.* Enrollment is limited to the number of students who can be accommodated.

(8) *Deposit.* Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

(9) *Changes in Registration.* The last day for changes in registration will be that date designated in § 11.3 of the University Regulations and Information for Students Calendar.

(10) B.Sc. Degree students registered in the Faculty of Dentistry may apply for the B.Sc. degree after successful completion of the first two years of the dental program.

(11) The Admissions Committee reserves the right to use its judgement with respect to individual cases. For example, in some instances, certain candidates such as applicants who have had extensive university education or have had extensive previous work experience in areas acceptable to the Admissions Committee may be given special consideration. Less weight may be given to the minimum criteria established for any one of the factors identified for admission. Applicants will normally be expected to have completed the prerequisite courses in chemistry, physics and biology or their equivalent, the Dental Aptitude Test and the interview.

(12) Applicants are reminded of the regulations set out in § § 13.1.2 and 13.1.3 of the University Regulations and Information for Students Calendar. Admission will normally be refused to an applicant who has had to write what the Faculty considers an inordinate number of examinations in order to attain the nominal entrance requirements of the University.

(13) A dental examination is required of all accepted candidates.

(14) Candidates seeking any other advice with respect to matters related to admissions should contact the Office of Admissions, Faculty of Dentistry.

(15) *English Language Proficiency:* English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;
2. presentation of a successfully completed full-yea

or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; *or*

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test center, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building, University of Alberta.

(16) *Advanced Standing.* Applications from dentistry graduates from other countries for admission into second year dentistry may be considered by the Admissions Committee. Application deadline is February 1st.

67.1.2 M.SC. AND PH.D. DEGREES

The requirements for admission as a graduate student are:

(1) A baccalaureate degree, with a grade point average of at least 6.0 in the work of the last two undergraduate years at The University of Alberta, or an equivalent qualification from another institution; and

(2) A statement from the chairman of the department concerned to the effect that the applicant is, in all respects, acceptable to the department. A special graduate student or an exchange graduate student, however, not being a candidate for a degree, does not require department recommendation.

(3) All *non-Canadians* for whom English is not the major language (a) first *must* write and pass satisfactorily either the Michigan English Language Examination (The Director, Testing and Certification Division, English Language Institute, The University of Michigan, Ann Arbor, Michigan 48104, U.S.A.) or the Test of English as a Foreign Language (TOEFL Educational Testing Service, Princeton, New Jersey 08540, U.S.A.) before formal admission can be given; and (b) in addition, if formally admitted, must arrive on campus and write, *one week before registration,* an English Language Examination set and administered by The University of Alberta. Students whose performance is unsatisfactory in this English Examination will be allowed to continue their graduate work, but may be required to take English language instruction as part of their regular program

Application for admission to the Faculty must be submitted on forms supplied by the Office of Graduate Studies and Research. No assurance can be given that applications received after August 15 (for First Term, Winter Session), November 15 (for Second Term, Winter Session); March 1 (for Spring Session) or April 2 (for the Summer Session) can be processed in time to permit registrations in that session. A graduate of another university must arrange with the Registrar of that institution to forward two transcripts of his/her academic record to the Dean prior to these dates. The Dean may require the applicant to furnish an official description of the content of the courses listed on the transcripts.

67.1.3 D.H. DIPLOMA

(1) *Academic Requirements.* A student applying for admission to the Dental Hygiene Program, must present Chemistry 30, Biology 30, and English 30 (or equivalents): and two of the following: Mathematics 30 or 33; Mathematics 31; Physics 30; Social Studies 30; Language (other than English) at the 30 level (or equivalents).

(2) *Adult Applicants.* Persons 21 years of age or older who do not meet regular matriculation requirements may, in certain circumstances, receive special consideration. Non-matriculated adult applicants to the Dental Hygiene Program must present Chemistry 30, Biology 30 and English 30, or equivalents of these courses, with a 60% overall average and not less than a 50% grade in any single course; and must be a resident of Alberta.

(3) *Dental Hygiene Aptitude Test.* All applicants are required to submit D.H.A.T. scores. Seating space is limited, therefore, it is recommended that candidates apply early in the year to write the exams. Applications are available from the Dental Hygiene Office, University of Alberta.

(4) *Personal Interview* (requirement for in-province applicants). Applicants resident in the Province of Alberta will be interviewed by a team to determine if they possess the personal qualities necessary for the profession. The interview is designed to evaluate an applicant's degree of maturity and motivation, initiative, ability to communicate and personal qualities and interests. The interview schedule differs from year to year, therefore, candidates will be advised of the interview dates.

Statement of Self-Assessment (requirement for out-of-province applicants). Out-of-province applicants are required to write a Statement of Self-Assessment, in lieu of the interview. The Statement of Self-Assessment form will be mailed to the applicant upon receipt of her/his application to the Dental Hygiene Division at the University of Alberta.

(5)*English Language Proficiency:* English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; *or*

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building, University of Alberta.

(6) *Application Deadline:* All candidates for admission to the Dental Hygiene Program are required to make application on or before February 1 of the year in which admission is sought. The earliest date for filing such applications is September 30 of the previous year.

(7) *Application for Admission.* The completion of a candidates file at an early date may result in the candidate's acceptance in the Dental Hygiene Program prior to the August Admissions Committee meeting. A file is considered complete when the following have been received: application for admission, official transcript of prior academic work, D.H.A.T. score, personal interview (in-province applicants) OR statement of self-assessment (out-of-province applicants). Files that are incomplete by July 25th of any year will not be considered by the Admissions Committee.

(8) *Final Selection:* Applicant profiles are made up of:

(a) Academic standing
(b) DHAT Score
(c) Interview results (in-province applicants)
Statement of Self-Assessment (out-of-province applicants)

Minimum criteria are established for each of the above factors. An applicant who falls below the minimum in any one of the above factors will not be considered for admission.

(9) *Residence Requirements.* Highest priority consideration for admission will be given to Canadian citizens who are Alberta matriculants (residents). Second consideration will be given to Canadian citizens, resident of other provinces. Third consideration will be given to all other candidates.

For admission purposes, a resident of Alberta is defined as a Canadian citizen or Landed Immigrant who has been domiciled in the Province ot Alberta or Yukon or North West Territories for at least one continuous year immediately prior to the date of intended registration at the University.

(10) *Limitation of Enrollment.* Enrollment is limited to the number of students who can be accommodated.

(11) *Dental Examination.* All accepted candidates are required to have a dental examination form (available from the Registrar's Office or from the Dental Hygiene Office) completed by a dentist and returned to the Program Chairman during the week of registration.

(12) *Notification of Acceptance.* The Admissions Committee meets about August 10 to consider all applications for admission to the Dental Hygiene Program. During the following week, all applicants will be informed of the decision on their application — namely, accepted, waiting list, or not accepted. Applicants in the category of accepted or waiting list must reply by return mail, signifying their decision to accept or refuse the position of their application in the Dental Hygiene Program. Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

Students should not come to the University until they have received an official acceptance of their application.

For further, more detailed information, consult § § 13.1 and 13.7 of the University Regulations and Information for Students Calendar.

67.1.4 ORTHODONTIC DIPLOMA

See § 67.1.2.

67.2 Academic Standing

67.2.1 D.D.S. DEGREE

(1) Students entering the dentistry program who have not previously successfully completed the university writing competence test will, unless otherwise informed, be required to do so in the first year of the program.

(2) Except in special circumstances students must complete each year before being promoted.

(3) Although the minimum passing grade for undergraduate courses in the University is 4, dental students receiving a final grade of 4 in a single course will be eligible for promotion only if their grade point average is equal to or greater than 5.5. A grade of 4 in more than one course, whatever the grade point average, will make a student in dentistry ineligible for promotion.

(4) Students will be required to pass both the practical and the theoretical examinations of any course having a practical and theoretical component.

(5) *Supplemental Examinations.* In order to qualify for supplemental examination privileges a student must have a minimum G.P.A. of 5.0. Supplemental examinations are not normally available in laboratory and clinical courses. A student is permitted to write a supplemental examination in no more than two courses in each year of the program. The maximum supplemental examination grade shall be a grade of 6 and the examination result(s) will not alter the student's class standing.

(6) Students will be permitted to repeat first-year Dentistry only in exceptional cases as determined by the Council of the Faculty of Dentistry.

(7) A student permitted to repeat a failed year, who does not achieve a grade-point average of 5.5 at the end of the First and Second Terms of the repeated year, will be required to withdraw from the program. A repeating student will not be permitted to carry a reduced academic load.

(8) *Course Exemptions.* Students in the dentistry program are not permitted to carry a reduced academic load. Students eligible for course exemptions

must make application to the Chairman of the Academic Standing Committee, at whose discretion course substitutions will be permitted. A repeating student in dentistry, with the exception of repeating students in the fourth year of the program, will not be exempted from any course. Repeating fourth year students may have a special course of studies set up by the Academic Standing Committee and may be recommended for graduation at the end of first term upon recommendation of the Academic Standing Committee and after consultation with the course directors.

(9) *Faculty Advisor.* At the discretion of the Academic Standing Committee, a Faculty Advisor may be assigned to students who are having difficulty meeting promotion requirements. The method of assignment and role of the Faculty Advisor shall be determined from time to time by the Dentistry Faculty Council.

(10) All students registered in the Faculty of Dentistry are required by Provincial legislation to be registered in the Educational Register of the Alberta Dental Association. This registration permits the practice of dentistry within the confines of the formal dental curriculum.

67.2.2 M.SC. AND PH.D. DEGREES

Except in a qualifying year, the pass mark in any course taken for credit towards an advanced degree is a grade of 6. Grades of 5 may be accepted in two single-term courses or one full-session course provided a minimum average of 6.0 is acquired at the time of completion of work for the degree. In this connection the student should keep in mind that courses are weighted differently. Thus a grade of 7 in a session or term course does not necessarily bring one's average up to 6.0 if a grade of 5 was received in another course which carried a greater weight. In a qualifying year, a grade of 4 or 5 may be accepted in an individual course, provided that the grade point average for the year's work is at least 6.0. (Note: The above are *minimum* grades which the Faculty will accept. Individual departments may require higher grades than these.) A grade of 4 obtained by Probationary, Special, or Exchange Graduate Students will be recorded as a failure.

Graduate students are not permitted to take supplemental examinations. If, after consulting the department or the committee concerned, the Faculty decides that a graduate student is not making satisfactory progress in either course work or research, the student may be required to withdraw. For further information see § 202.4 of the Faculty of Graduate Studies and Research calendar.

67.2.3 D.H. DIPLOMA

In addition to the regulations set out in § 16 of the University Regulations and Information for Students Calendar, the following apply to students in the Dental Hygiene Program:

(1) Students entering the Dental Hygiene program who have not previously successfully completed the university writing competence test, will, unless otherwise informed, be required to do so in the first year of the program. In order to be eligible for graduation, students must present a valid, current St. John's Ambulance Service certificate from the standard first-aid course by March 1st of the year of graduation.

(2) Advanced standing will be granted to Dental Hygiene applicants (students) who have completed approved university courses (see § 14.4.1 University Regulations and Information for Students Calendar). Applicants (students) eligible for course exemption(s) must advise the Dental Hygiene Program Director by September 15th. Upon consultation with the Program Director, the student may elect to choose an approved option or carry a reduced academic load. A student who chooses to carry a reduced academic load other than English 210, for first year Dental Hygiene and Sociology 202 and Psychology 260 for second year Dental Hygiene, will not be eligible for awards or class standing.

(3) Recommendations for promotion and graduation will be on the basis of a grade of at least 4 in each subject and a grade-point average of at least 5.0.

(4) Credit may be granted for a grade of 3 when the following conditions apply:

(i) The grade-point average for the year is 5.5 or higher;

(ii) not more than one such grade is granted per year;

(5) The records of all students will be reviewed at the end of each academic year by the Academic Standing Committee of the Faculty of Dentistry and the Council of the Faculty of Dentistry. Where a student has not met the above requirements, permission to write one or more supplemental examinations is at the discretion of the Academic Standing Committee and the Council of the Faculty of Dentistry. Each case will be considered on the basis of a student's yearly performance and supplemental privileges may be granted provided the writing of these examinations makes it mathematically possible to raise the grades to a pass or for the student to obtain a G.P.A. of 5.0, and provided it is sanctioned by the instructor involved, the Academic Standing Committee and the Faculty Council.

(6) Because of early registration, a student may be conditionally promoted pending the results of supplemental examinations written in the month of August. If the deficiencies are not cleared, a student may be asked to repeat the failed year or to withdraw from the Program.

(7) Students seeking to repeat a failed year in the Dental Hygiene Program during the academic session immediately following the failure will not be guaranteed readmission, but will be considered on an individual basis by the Admissions Committee.

(8) Students seeking to repeat a failed year after an absence of one academic session or more, will be considered at the Admissions Committee meeting for that academic session.

(9) Repeating students are required to take the entire course load.

67.2.4 ORTHODONTICS DIPLOMA

See § 67.2.2.

67.3 Appeal Procedure

67.3.1 DENTAL HYGIENE DIPLOMA, D.D.S. DEGREE, AND POSTGRADUATE DIPLOMA STUDENTS

Students should attempt to resolve all issues of contention in the first instance with the individual instructor and then the Department Chairman.

Following such attempts, the student may bring the matter to the attention of the Dean.

Should the matter remain unresolved the student may wish to file a formal appeal with the Dean stating the basis of the appeal in writing and in detail. The Dean will then place the issue before the Executive Committee of the Council of the Faculty of Dentistry which shall elect an 'ad hoc' Appeal Committee of five

academic Faculty members from the Faculty of Dentistry and one student from the appropriate program. One of the elected Faculty members shall be designated as the Chairman of the Committee. Procedural guidelines for the Faculty Appeals Committee are those approved by the Dentistry Faculty Council, a copy of which may be obtained from the Office of the Dean. The deadline for the receipt of notice of intent to appeal shall be June 30 of the academic year in question.

In the event of an unsuccessful appeal, a student may go to the Academic Appeals Committee of General Faculties Council (See § 16.7 of the University Regulations and Information for Students Calendar).

67.3.2 M.SC. AND PH.D. DEGREES

Student grievances of an academic nature sometimes arise. If this occurs, students in the Faculty of Graduate Studies and Research are advised to first contact the instructor concerned from whom, in most cases, satisfactory explanations will be obtained. If the matter is not resolved, students are advised to see the Department Chairman and the Dean of the Faculty of Graduate Studies and Research, in that order.

For further information regarding Appeals Procedures at the Faculty level the student should seek the advice of the Dean.

For further information related to Appeals and Grievances, students are directed to § 16.7 of the University Regulations and Information for Students Calendar and § 202.8 of the Faculty of Graduate Studies and Research calendar.

68 PROGRAMS OF STUDY

68.1 D.D.S. Degree

The courses prescribed for the degree program , 1980-81 are listed below for each of the four years of the program. The format is as folows: the first position indicates total lecture hours per term; the second position indicates total clinic hours per term; and the third indicates total laboratory hours per term. In § 69, Details of Courses, they are grouped by subject area.

	First Term (Total Hours)	*Second Term (Total Hours)*
First Year		
ANAT 412 (Gross Anatomy) ★5	45-0-60	—
ANAT 417 (Microscopic Anatomy) ★3	30-0-30	—
ANAT 419 (Neuroanatomy) ★2	—	15-0-15
PHYSL 451 (Human / Oral Physiology) ★6	45-0-0	45-0-0
BACT 422 (Bacteriology) ★3	30-0-10	—
DENT 401 (Oral Histology) ★3	—	30-0-30
DENT 402 (Comparative Odontology) ★0.5	—	7-0-0
DENT 403 (General Biochemistry) ★4	30-0-0	30-0-0
DENT 404 (Community Dentistry) ★2	15-0-0	15-0-0
DENT 405 (Oral Anatomy) ★1	15-0-0	—
DENT 406 (Oral Anatomy) ★1	0-0-30	—
DENT 407 (Occlusion) ★1	—	15-0-0
DENT 408 (Occlusion) ★2	—	0-0-45
DENT 409 (Dental Caries) ★0.5	5-0-0	—
DENT 410 (Removable Prosthodontics) ★2	—	30-0-0
DENT 411 (Removable Prosthodontics) ★3	—	0-0-60
DENT 412 (Operative Dentistry) ★2	15-0-0	15-0-0
DENT 413 (Operative Dentistry) ★3	0-0-45	0-0-45
DENT 414 (Dental Therapeutics) ★2	—	30-0-0
DENT 415 (Diagnosis) ★1	—	15-0-0
DENT 416 (Periodontics) ★1	—	15-0-0
DENT 417 (Periodontics) ★1	—	0-30c-0
DENT 418 (Oral Biology and Embryology) ★1	15-0-0	—
DENT 419 (Dental Materials) ★1	15-0-0	—
Second Year		
DENT 422 (Bacteriology) ★3	30-0-10	—
PMCOL 470 (General Pharmacology) ★6	45-0-14	45-0-0
PATH 422 (General Pathology) ★3	30-0-16	—
DENT 420 (Complete Denture Prosthodontics) ★2	15-0-0	15-0-0
DENT 430 (Complete Denture Prosthodontics) ★3	0-0-45	0-0-45
DENT 421 (Partial Denture Prosthodontics) ★2	15-0-0	15-0-0
DENT 436 (Partial Denture Prosthodontics) ★3	0-0-45	0-0-45
DENT 422 (Operative Dentistry) ★2	15-0-0	15-0-0
DENT 423 (Operative Dentistry) ★5	0-0-90	0-45c-0
DENT 424 (Fixed Prosthodontics) ★1	15-0-0	—
DENT 425 (Fixed Prothodontics) ★3	0-0-45	0-0-45
DENT 426 (Periodontics) ★2	15-0-0	15-0-0
DENT 427 (Periodontics) ★2	0-22c-0	0-23c-0
DENT 428 (Pedodontics) ★1	—	15-0-0
DENT 429 (Dental Materials) ★3	15-0-30	15-0-0
DENT 431 (Nutrition) ★1	—	15-0-0
DENT 432 (Behavioural Science) ★1	15-0-0	—
DENT 433 (Immunology) ★0.5	—	8-0-0
DENT 434 (Dental Therapeutics) ★3	0-0-22	0-0-45
DENT 435 (Diagnosis and Oral Radiology) ★3	15-0-0	15-0-30
DENT 437 (Oral Pathology) ★3	—	30-0-30
DENT 439 (Dental Caries) ★0.5	—	5-0-0
DENT 440 (Orthodontics) ★1	—	15-0-0
Third Year		
MED 434 (Medicine) ★1	—	15-0-0
SURG 434 (Surgery) ★1	—	15-0-0
DENT 450 (Removable Prosthodontics) ★2	30-0-0	—
DENT 451 (Removable Prosthodontics) ★5	0-75c-0	0-75c-0
DENT 452 (Operative Dentistry) ★1	15-0-0	—
DENT 453 (Operative Dentistry) ★7	0-86c-0	0-86c-0
DENT 454 (Fixed Prosthodontics) ★3	30-0-0	15-0-0
DENT 455 (Fixed Prosthodontics) ★6	0-0-90	0-82c-0
DENT 456 (Periodontics) ★2	15-0-0	15-0-0
DENT 457 (Periodontics) ★3	0-38c-0	0-38c-0
DENT 458 (Pedodontics) ★2	15-0-0	15-0-0
DENT 459 (Pedodontics) ★3	0-0-45	0-45c-0
DENT 460 (Orthodontics) ★2	15-0-0	15-0-0
DENT 461 (Orthodontics) ★2	0-0-30	0-0-30
DENT 462 (Endodontics) ★1	15-0-0	—
DENT 463 (Endodontics) ★2	0-0-22	0-30c-0
DENT 464 (Community Dentistry) ★1	—	15-0-0
DENT 465 (Diagnosis and Oral Radiology) ★1	15-0-0	—
DENT 466 (Diagnosis and Oral Radiology) ★2	0-54c-0	—
DENT 467 (Correlated Science Seminars) ★1	—	15-0-0
DENT 468 (Oral Surgery) ★3	15-14c-0	15-14c-0
DENT 469 (Elective Study) ★1	—	15-0-0
Fourth Year		
DENT 470 (Removable Prosthodontics) ★2	15-0-0	15-0-0
DENT 471 (Removable Prosthodontics) ★6	0-70c-0	0-70c-0
DENT 473 (Operative Dentistry) ★9	3-80c-0	3-80c-0
DENT 474 (Fixed Prosthodontics) ★2	15-0-0	15-0-0
DENT 475 (Fixed Prosthodontics) ★5	0-50c-0	0-50c-0
DENT 476 (Periodontics) ★2	15-0-0	15-0-0
DENT 477 (Periodontics) ★3	0-30c-0	0-30c-0
DENT 478 (Pedodontics) ★2	15-0-0	15-0-0
DENT 479 (Pedodontics) ★3	0-30c-0	0-30c-0
DENT 480 (Orthodontics) ★2	15-0-0	15-0-0

DENT 481 (Orthodontics) ★3	0-30c-0	0-30c-0
DENT 483 (Endodontics) ★2	0-22c-0	6-23c-0
DENT 484 (Community Dentistry) ★1	—	15-0-0
DENT 485 (Diagnosis) ★1	15-0-0	—
DENT 487 (Clinical Oral Pathology) ★1	15-0-0	—
DENT 488 (Oral Surgery) ★2	15-0-0	15-0-0
DENT 489 (Oral Surgery) ★1	0-18c-0	0-18c-0
DENT 490 (Practice Management) ★2	15-0-0	15-0-0
DENT 491 (Dental Auxiliary Utilization Clinic) ★3	0-45c-0	0-45c-0
DENT 492 (Hospital Dentistry) ★2	0-30c-0	0-30c-0
DENT 493 (Mobile Clinic) ★2	0-30c-0	0-30c-0

Clinical Dentistry. Students of the two final years are required to carry to completion a specified amount of treatment of patients in the various branches of Dentistry and are assigned to the diagnostic clinic for specified periods in rotation.

68.2 M.Sc. and Ph.D. Degrees

(1) The courses of study for the degree program are selected by the thesis supervisor or supervisory committee and the Committee of Graduate Studies and Research of the Faculty of Dentistry within the regulations and guide-lines of the Faculty of Graduate Studies and Research.

(2) The thesis requirement for the Master of Science degree or Doctor of Philosophy degree are detailed in the Calendar or the Faculty of Graduate Studies and Research; refer to section 203.

(3) A list of courses available in Graduate Studies in the Faculty of Dentistry is given in section 69.2 below.

(4) Students are permitted to undertake graduate courses in other faculties of the University.

68.3 D.H. Diploma

	First Term (Total Hours)	*Second Term (Total Hours)*
First Year		
D HYG 203 (Dental Anatomy) ★3	39-0-0	—
D HYG 205 (Dental Radiography) ★2	—	26-6-0
ENGL 210 (English) ★6	39-0-0	39-0-0
D HYG 212 (Dental Auxiliary Practice I & II) ★14	39-0-117	39-78c-0
D HYG 213 (Anatomy and Physiology) ★6	26-0-39	26-0-39
D HYG 220 (Nutrition) ★2	26-0-0	—
D HYG 222 (Oral Histology and Embryology) ★3	—	26-0-26
D HYG 223 (Dental Materials) ★4	—	26-0-39
D HYG 227 (Periodontology for the Dental Hygienist) ★1	—	13-0-0
Second Year		
SOC 202 (Introductory Sociology) ★6	39-0-0	39-0-0
PSYCO 260 (Psychology) ★3	—	39-0-0
BACT 422 (Bacteriology) ★3	30-0-10	—
D HYG 301 (Communications) ★3	—	26-0-0
D HYG 302 (Oral Pathology) ★3	26-0-26	—
D HYG 305 (Pharmacology) ★2	26-0-0	—
D HYG 312 (Dental Auxiliary Practice III & IV) ★6	39-0-0	39-0-0
D HYG 314 (Oral Physiology) ★1	13-0-0	—
D HYG 315 (Dental Radiography) ★2	0-18-0	0-9-0
D HYG 316 (Dental Auxiliary Practice III & IV) ★6	0-175-0	0-175-0
D HYG 321 (Dental Health Education) ★6	26-0-39	13-0-39
D HYG 322 (Dental Public Health) ★2	26-0-0	—
D HYG 323 (Biochemistry) ★3	—	39-0-0

68.4 Orthodontic Diploma

Refer to § 68.2.

68.5 Continuing Education

Courses are offered by various departments from time to time to provide a program of continuing education for the dental profession. A program outlining dates, course descriptions, participation, and length is prepared annually and distributed to the profession.

69 DETAILS OF COURSES

69.1 D.D.S. Degree

69.1.1 GENERAL INFORMATION

Courses open to students in the Faculty of Dentistry are listed here in alphabetical order, whether they are offered by the Faculty of Dentistry or by another faculty, except the graduate courses, which are listed separately in § 69.2.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★", standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages.

The figures, enclosed in parentheses, indicate the total hours of instruction in the course. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

A list of recommended textbooks will be available at registration. Detailed information may be obtained by contacting the Assistant Dean, Faculty of Dentistry.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. COURSE DESCRIPTIONS OUTLINED BELOW ARE THOSE COURSES OFFERED DURING THE 1980-81 SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

69.1.2 BASIC SCIENCES

ANAT 412. *Gross Anatomy.* ★5 (First Term, 105 hrs.). Gross anatomy of the body in general and of the head and neck in detail, with emphasis on clinical dental practice. This course is open only to dental students.

ANAT 417. *Microscopic Anatomy.* ★3 (First Term, 60 hrs.). The microscopic features of cells, tissues and organs of the human body to provide a comprehensive knowledge in the basics of general human histology. This course is open only to dental students.

ANAT 419. *Neuroanatomy.* ★2 (Second Term, 30 hrs.). A basic course in the main structural and functional aspects of the central nervous system, with emphasis on the practical importance of neurological science rather than theoretical concepts. This course is open only to dental students.

BACT 422. *Bacteriology.* ★3 (First Term, 40 hrs.). General bacteriology, illustrating the fundamental aspects of infection and resistance. Special bacteriology of the mouth including dental caries and periodontal diseases.

PATH 422. *General Pathology.* ★3 (First Term; 46 hrs.). Lectures on the principles of pathology, laboratory instruction in histopathology and an introduction to the functions of a pathology laboratory in a hospital.

PMCOL 470. *General Pharmacology.* ★6 (104 hrs.). The pharmacological action of drugs selected for their physiological and clinical significance. Basic pharmacological principles are applied to representative drugs having their primary action on various organ systems of the body. Classes of drugs studied include general and local anaesthetics, hypnotics, sedatives and anti-convulsants, analgesics, central nervous system stimulants, autonomic and curariform drugs, histamine and anti-histaminics, chemotherapeutic agents and antibiotics.

PHYSL 451. *Human Oral Physiology.* ★6 (90 hrs.). A comprehensive lecture course on mammalian and human physiology with emphasis on oral physiological topics. Available to students in the Faculty of Dentistry only.

69.1.3 DENTAL CARIES

DENT 409. *Dental Caries.* ★0.5 (First Term: 5 hrs.). An integrated module on dental caries by both oral biology and clinical sciences.

DENT 439. *Dental Caries.* ★0.5 (Second Term: 5 hrs.). A continuation of the integrated module on dental caries. Clinically relevant situations will be presented.

69.1.4 DENTAL HEALTH CARE

DENT 404. *Community Dentistry.* ★2 (30 hrs.). To acquaint the student with the history of the profession of dentistry and to awaken in the student an awareness that his professional conduct is related to his patient, his profession and his community on sociological principles embodied in professional code of moral principles.

DENT 431. *Nutrition.* ★1 (Second Term: 15 hrs.). Basics of nutrition and diets and their practical application in Dentistry. Prerequisite: DENT 403.

DENT 432. *Behavioral Science.* ★1 (First Term: 15 hrs.). An introduction to behavioral science as it relates to the psychology of patient and staff management, including didactic material on treatment plan presentation and motivational theory.

DENT 464. *Community Dentistry.* ★1 (Second Term: 15 hrs.). The concepts of community dental health with major emphasis on the role of dentistry in private practice and in the community. A comprehensive approach to the dental health problem, including biometrics as applied in dentistry, prevention and control of dental diseases, auxiliary personnel, and recent legislation.

DENT 484. *Community Dentistry.* ★1 (Second Term: 15 hrs.). The moral and legal aspects of the practice of dentistry. The legal factors are presented and discussed by members of the Faculty of Law. The teaching of Forensic Odontology will be coordinated with related material presented in other courses.

DENT 490. *Practice Management.* ★2 (30 hrs.). Office procedures and administration. The effective integration of auxiliary services.

DENT 491. *Dental Auxiliary Utilization Clinic.* ★3 (90 hrs.). Each student will spend a period of time during the year in a Dental Auxiliary Utilization Clinic. This course is a practical extension of DENT 490.

DENT 493. *Mobile Clinic.* ★2 (60 hrs.). Each student will spend 2 weeks in a Mobile Dental Clinic in an area of need of the Province. This course is a practical extension of DENT 490.

DENT 469. *Elective Study.* ★1 (Second Term: 15 hrs.). A program of electives will be offered. Clinical, sociological and research electives will be emphasized.

69.1.5 DENTAL MATERIALS

DENT 419. *Dental Materials.* ★1 (First Term: 15 hrs.). Introduction to the scientific basis for the selection and manipulation of dental materials. The specific materials systems to be discussed will be thermoplastic impression materials, amalgams and dental cements.

DENT 429. *Dental Materials.* ★3 (60 hrs.). Lectures, seminars and laboratory in which every student has a contract requirement to actively contribute to the class in discovering why dental materials behave in the way that they do. An understanding of how or why materials behave as they do greatly enhances treatment planning and service to patients. Specific materials systems to be dealt with will include technique materials, dental metals, ceramics, resins plus bases and liners.

69.1.6 DENTAL THERAPEUTICS

DENT 414. *Dental Therapeutics.* ★2 (Second Term: 30 hrs.). The rationale of drug therapy in the treatment of oral disease and lectures and demonstrations on the administration of local anaesthetics including pain and anxiety control.

DENT 434 *Dental Therapeutics* ★3 (67 hrs.) The rationale of drug therapy in the treatment of oral disease and lectures and demonstrations on the administration of local anaesthetics including pain and anxiety control.

69.1.7 DIAGNOSIS AND ORAL RADIOLOGY

DENT 415. *Diagnosis.* ★1 (Second Term: 15 hrs.). The fundamental principles of the clinical study of disease and practical experience in taking histories and doing clinical examinations

DENT 435. *Diagnosis and Oral Radiology.* ★3 (66 hrs.). The fundamental and elementary principles of dental roentgenology. Tests for the detection of infection, chemical intoxication, neoplasia, hormone imbalance, nutritional disturbances, stress disorders, hemorrhagic diathesis and dental caries susceptibility.

DENT 465. *Diagnosis and Oral Radiology.* ★1 (First Term: 15 hrs.). Case presentations by students emphasizing the total case concept of patient management.

DENT 466. *Diagnosis and Oral Radiology.* ★2 (First Term: 54 hrs.). The student will receive clinical experience in the Oral Diagnosis Clinic.

DENT 485. *Diagnosis.* ★1 (First Term: 15 hrs.). The management of oral disease is continued from DENT 465 / 466. Students are assigned patients for comprehensive care and are also assigned a number of emergency cases.

69.1.8 ENDODONTICS

DENT 462. *Endodontics.* ★1 (First Term: 15 hrs.). The conservation of pulp-involved and pulpless teeth. Procedures for diagnosis and treatment described, demonstrated and correlated with the related dental and basic sciences.

DENT 463. *Endodontics.* ★2 (52 hrs.). Laboratory practice on manikins under simulated clinical conditions. An introduction to clinical procedures with treatment carried out on selected patients.

DENT 483. *Endodontics.* ★2 (51 hrs.). A continuation of Dentistry 463 with application to clinical practice. Endodontic treatment will be carried out on selected patients.

69.1.9 FIXED PROSTHODONTICS

DENT 405. *Oral Anatomy.* ★1 (First Term: 15 hrs.). This course consists of a detailed study of the anatomy of the teeth individually and collectively.

DENT 406. *Oral Anatomy.* ★1 (First Term: 30 hrs.). The teaching of dental morphology and manual dexterity will be accomplished by carving the coronal morphology of representative teeth in wax.

DENT 407. *Occlusion.* ★1 (Second Term: 15 hrs.). Those principles of occlusion common to all disciplines of clinical dentistry will be covered to provide the student with a basic understanding of the fundamentals involved. This will be the initial phase of an integrated teaching module and will orient the student to the basic philosophy of occlusion and give him a correlated foundation from which deviations can be developed by the various clinical departments.

DENT 408. *Occlusion.* ★1 (Second Term: 45 hrs.). The concepts of occlusion will be reinforced in laboratory periods through the use of articulated models and the fabrication of an ideal occlusal model in wax.

DENT 424. *Fixed Prosthodontics.* ★1 (First Term: 15 hrs.). This course will include principles of dental hard tissue surgery for extra-coronal retainers, principles of appliance design and fabrication and special occlusal considerations.

DENT 425. *Fixed Prosthodontics.* ★3 (90 hrs.). Laboratory instruction on the basic principles in the construction and preparation of abutment teeth for the reception of retainers, piers, pontics and connectors for a fixed partial denture. Manikins are used on which a simple bridge is constructed. Experience with porcelain fused to metal will be introduced.

DENT 454. *Fixed Prosthodontics.* ★3 (45 hrs.). Handling of the various materials used and engineering principles involved in fixed partial denture construction. Instruction in the fabrication of a porcelain jacket crown. Porcelain fused to metal fixed prosthodontic techniques will be covered.

DENT 455. *Fixed Prosthodontics.* ★6 (172 hrs.). A designated number of units of fixed dentures will be completed. Clinical programs will provide direction and experience in these areas.

DENT 474. *Fixed Prosthodontics.* ★2 (30 hrs.). Advanced clinical aspects of fixed prosthodontics.

DENT 475. *Fixed Prosthodontics.* ★5 (100 hrs.). Practical application of the techniques covered in the lecture portion.

69.1.10 OPERATIVE DENTISTRY

DENT 412. *Operative Dentistry.* ★2 (30 hrs.). Included will be discussions of basic operating principles; cutting instruments; principles of cavity nomenclature and classification; the principles of cavity preparations along with the manipulation requirements of amalgam and gold foil.

DENT 413. *Operative Dentistry.* ★3 (90 hrs.). Cavity preparations will be cut in artificial and extracted natural teeth and manipulation of both silver amalgam and gold foil will be practiced. Students are responsible for supplying both anterior and posterior natural teeth for their own use.

DENT 422. *Operative Dentistry.* ★2 (30 hrs.). A continuation of DENT 412 with emphasis being given to the use of gold foil in situations other than class V, the use of gold inlays, an introduction into the use of white restoratives and the use of amalgam with pin retention in extensively broken down teeth.

DENT 423. *Operative Dentistry.* ★5 (135 hrs.). Both natural (extracted) teeth and artificial teeth will be used in practising the techniques related to gold foils, gold inlays, some white restoratives and large pin amalgams. The second term will be an introducation to the clinic where students will prepare and place silver amalgam restorations in patients.

DENT 452. *Operative Dentistry.* ★1 (First Term: 15 hrs.). The principles and procedures necessary to successful clinical practice will be emphasized. This is a continuation of DENT 422 in which the material will be covered in more depth and oriented specifically to dealing with patients rather than just in a laboratory situation. All the materials used in operative will be included in the discussions but special emphasis will be given to white restoratives.

DENT 453. *Operative Dentistry.* ★7 (172 hrs.). Clinical practice on patients will be provided to allow the student to develop the necessary operative skills. All materials, amalgam, gold inlays, gold foil and white restoratives will be used. The proper operating environment using rubber dam along with orderly procedures will be mandatory.

DENT 473. *Operative Dentistry.* ★9 (166 hrs.). A continuation of DENT 453 in which students will be expected to increase their skills and efficiency in operative dentistry to the point where they are capable of completely independent professional judgement and execution. The use of all the types of operative materials is mandatory as is the use of rubber dam in providing a proper operating environment. Observing when and how other students are doing as well as critically assessing that which is observed will be a part of the seminar portion of the course.

69.1.11 ORAL AND MAXILLOFACIAL SURGERY AND HOSPITAL, DENTISTRY

DENT 468. *Oral Surgery.* ★3 (58 hrs.). Diagnosis and treatment of the various conditions of the mouth requiring surgical care, including removal of teeth.

DENT 488. *Oral Surgery.* ★2 (30 hrs.). Instruction and demonstrations of exodontia and minor oral surgical procedures under both local and general anaesthesia.

DENT 489. *Oral Surgery.* ★1 (36 hrs.). This program will give the student experience in exodontia and minor surgery procedures.

DENT 492. *Hospital Dentistry.* ★2 (60 hrs.). A two week period of hospital training for senior students where they become familiar with hospital protocol and operating room procedures, observe oral surgery and anesthesia, attend other medical and dental clinics, perform physical evaluation of patients and provide emergency dental care and patient treatment services.

MED 434. *Medicine.* ★1 (Second Term: 15 hrs.). General aspects of medicine with particular reference to local and systematic diseases of dental interest.

SURG 434. *Surgery.* ★1 (Second Term: 15 hrs.). Surgical problems in the head and neck region of particular interest to the dental student.

69.1.12 ORAL BIOLOGY

DENT 401. *Oral Histology.* ★3 (Second Term: 60 hrs.). The development and histology of the teeth and adjacent structures in man.

DENT 402. *Comparative Odontology.* ★0.5 (Second Term: 7 hrs.). A series of lectures which will draw attention to and analyses of, the many unique features of the human dentition, both morphological and functional, by comparing them with those of other recent and fossil animals.

DENT 403. *General Biochemistry.* ★4 (60 hrs.). Designed to give students in first year dentistry an appreciation of general biochemical concepts in relation to metabolism. In addition, certain topics in oral biochemistry are considered.

DENT 418. *Oral Biology and Embryology.* ★1 (First Term: 15 hrs.). Human embryology with special emphasis on the developmental processes involved in the formation of the head and neck. The effects of abnormalities on these processes.

DENT 433. *Immunology.* ★0.5 (Second Term: 8 hrs.). The study of cell, tissue and humeral immunity.

DENT 437. *Oral Pathology.* ★3 (Second Term: 60 hrs.). The diagnosis, pathology and treatment of common diseases of the teeth and adjacent structures.

DENT 467. *Correlated Science Seminars.* ★1 (Second Term: 15 hrs.). Selected topics will be presented by various means involving staff / student participation. The clinical relevance of earlier basic science teaching will be demonstrated.

DENT 487. *Clinical Oral Pathology.* ★1 (First Term: 15 hrs.). Reading assignments on diseases will be made and cases presented for each student to diagnose. Discussions will follow and will include treatment considerations.

69.1.13 ORTHODONTICS

DENT 440. *Orthodontics.* ★1 (Second Term: 15 hrs.). Growth and development of the dento-facial complex, and embryology of the face and jaws.

DENT 460. *Orthodontics.* ★2 (30 hrs.). Introduction to etiology, classification, diagnosis, prevention and interception of malocclusions.

DENT 461. *Orthodontics.* ★2 (60 hrs.). Laboratory instruction in impression, model and soldering techniques and the construction of appliances designed for cases requiring simple treatment.

DENT 480. *Orthodontics.* ★2 (30 hrs.). Each student presents two seminars. Demonstrations are given on selected clinical problems.

DENT 481. *Orthodontics.* ★3 (60 hrs.). Clinical experience, involving preventive, interceptive and simple treatment of orthodontic problems of particular concern to the general practitioner, is designed to enable the student to apply knowledge acquired in the lectures and laboratory.

69.1.14 PEDODONTICS

DENT 428. *Pedodontics.* ★1 (Second Term: 15 hrs.). Mental, physical and behavioral development of children in the family and the community. Child behavior in the dental environment.

DENT 458. *Pedodontics.* ★2 (30 hrs.). This course is designed to provide the student with the basic background material necessary to accomplish effective treatment of pre-school and school age children in a clinical setting.

DENT 459. *Pedodontics.* ★3 (90 hrs.). The laboratory course is designed to provide the student with the attainment of basic technical skills necessary to effectively carry out treatment for child patients in the clinic. The clinical component gives the student the opportunity to put into practice with patients, the various techniques acquired in the lab sessions.

DENT 478. *Pedodontics.* ★2 (30 hrs.). The lecture program is designed to provide the student with an advanced and deeper insight into the diagnosis, treatment and management of preschool and school age children. Particular emphasis is given to children with extensive dental disease problems and various types of handicaps.

DENT 479. *Pedodontics.* ★3 (60 hrs.). The pedodontic clinic is designed to provide the student with experience in diagnosis and treatment of more complex dental problems as well as the competent management of child behavior in a dental setting.

69.1.15 PERIODONTICS

DENT 416. *Periodontics.* ★1 (Second Term: 15 hrs.). An illustrative lecture course devoted to etiology, systemic factors, clinical laboratory tests, nutritional deficiencies and clinical problems in periodontal therapy. Objectives of therapy, diagnosis and prognosis and treatment planning for the periodontally involved mouth will be presented. The interrelationship of periodontics and other phases of dentistry will be stressed.

DENT 417. *Periodontics.* ★1 (Second Term: 30 hrs.). The clinic sessions will introduce the student to introductory periodontal therapy including charting, scaling, polishing and elementary gingival surgery. The histology of supporting tissues will be introduced.

DENT 426. *Periodontics.* ★2 (30 hrs.). The program begun in first year will be continued with additional lecture material.

DENT 427. *Periodontics.* ★2 (45 hrs.). The program begun in first year will be continued with additional clinical experience for the student.

DENT 456. *Periodontics.* ★2 (30 hrs.). The periodontal program is designed to give the student experience in all phases of periodontal case management. The lectures are devoted largely to periodontal therapy.

DENT 457. *Periodontics.* ★3 (76 hrs.). Students will receive clinical experience in most phases of periodontal therapy.

DENT 476. *Periodontics.* ★2 (30 hrs.). A continuation of DENT 456.

DENT 477. *Periodontics.* ★3 (60 hrs.). Clinical experience in treatment of more advanced cases, including furcations. Treatment planning is reinforced.

69.1.16 REMOVABLE PROSTHODONTICS

DENT 410. *Removable Prosthodontics.* ★2 (Second Term: 30 hrs.). A lecture-audio / visual series that will relate to the DENT 411 laboratory experience; an introduction to removable partial dentures specific to classification, component parts, physiological / psychological design concepts and natural tooth recontouring.

DENT 411. *Removable Prosthodontics.* ★3 (Second Term: 60 hrs.). A laboratory experience that simulates clinical procedures and which requires the application of the concepts presented in DENT 410.

DENT 420. *Complete Denture Prosthodontics.* ★5 (30 hrs.). The lectures relate the material learned in Anatomy 412, Anatomy 417 and Physiology 451 to the principles of complete denture construction.

DENT 430. *Complete Denture Prosthodontics.* ★3 (90 hrs.). The laboratory exercises are designed to teach the student the technical aspect of complete denture construction.

DENT 421. *Partial Denture Prosthodontics.* ★2 (30 hrs.). The lectures will deal with the diagnosis and treatment planning of extra coronally attached removable partial dentures.

DENT 436. *Partial Denture Prosthodontics.* ★3 (90 hrs.). The students will be taught how to survey and design all classes of removable partial dentures and given an opportunity to practice impression procedures.

DENT 450. *Removable Prosthodontics.* ★2 (First Term: 30 hrs.). A lecture-audio / visual series that relates to the DENT 451 clinical practice; an introduction to basic clinical prosthodontics specific to clinical procedures and patient management.

DENT 451. *Removable Prosthodontics.* ★5 (150 hrs.). A clinical experience offering instruction in treating edentulous patients.

DENT 470. *Removable Prosthodontics.* ★2 (30 hrs.). A lecture-audio / visual series that introduces the student to advanced prosthodontic procedures.

DENT 471. *Removable Prosthodontics.* ★6 (140 hrs.). An advanced clinical experience offering instruction in treating patients requiring complete dentures, removable partial dentures, immediate surgical dentures, relines and overdentures.

69.2 Graduate Courses

The hours of instruction in the course per week are indicated by the three figures in the parenthesis after the term. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated.

DENT 500. *Cephalometrics.* ★5 (First Term, 0-3s-3). Measurements of cranial and jaw relationships by radiographic techniques.

DENT 501. *Advanced Pedodontics.* ★11 (1-9c-0).

DENT 502. *Advanced Oral Pathology.* ★3 (First Term, 3-0-0). A review of diseases which affect the oral tissues and exploration of recent additions to knowledge pertaining to them.

DENT 503. *Mineralization in Biological Systems.* ★3 (First Term, 3-0-0).

DENT 504. *Oral Biology (Applied Anatomy).* ★3 (First Term, 3-0-0). Consideration of developmental and gross anatomy related to the appreciation and practice of dentistry.

DENT 505. *Dental Biochemistry and Physiology.* ★2 (Second Term, 2-0-0).

DENT 506. *Oral Medicine.* ★3 (Second Term, 3-0-0). A study of the mechanisms of oral disease as a basis for rationale of treatment.

DENT 507. *Research Methodology.* ★1 (Second Term, 1-0-0). Reading assignments, the preparation of a detailed plan for a research project and its defense.

DENT 510. *Recent Advances in Oral Medicine.* ★1 (First Term, 1-0-0). In a series of 14 lectures the current status of Oral Medicine — Oral Pathology is reviewed. The emphasis is on an application of new knowledge to the diagnosis and management of dental and paradental disease processes in adolescents.

DENT 540. *Advanced Complete Denture Prosthodontics.* ★11 (1-0-9).

DENT 541. *Advanced Removable Partial Denture Prosthodontics.* ★8 (1-0-6).

DENT 550. *Clinical Orthodontics.* ★17 (1-3c-0; 6-18c-0). A course designed to give the student the clinical training necessary to treat orthodontic problems. The edgewise technique is the basic system taught in the clinical program.

DENT 551. *Orthodontic Technique.* ★6 (First Term, 1-0-9). Lectures on the biomechanical principles involved in orthodontic tooth movement. The laboratory entails advanced techniques to teach the student the skills and methods of manipulating orthodontic materials and fabricating the appliances required to treat orthodontic clinical problems.

DENT 552. *Orthodontic Seminar.* ★4 (Second Term, 0-4s-0). Orthodontic theory including etiology and diagnosis of malocclusion, treatment planning and philosophy of treatment techniques.

DENT 553. *Craniofacial Growth and Development.* ★2 (Second Term, 0-2s-0). A detailed review of the postnatal growth and development of human craniofacial structures. This course involves an analysis of the cephalometric and growth studies especially related to the practice of orthodontics.

DENT 554. *Functional Occlusion.* ★3 (Second Term, 3-0-0).

DENT 555. *Dental Materials.* ★2 (First Term, 2-0-0). The course will cover the structure, properties and testing methods relative to dental materials. Specific materials and the clinical and biological significance of their properties will be discussed.

DENT 556. *Orthodontic Diagnosis and Treatment Planning.* ★3 (First Term, 3-0-0). Designed to develop in the student the creative ability and critical analysis necessary to diagnose orthodontic problems and to treatment plan critical cases. Limitations to orthodontic therapy will be emphasized during treatment planning.

DENT 557. *Clinical Orthodontics.* ★6 (6-18c-0). A continuation of DENT 550 for students in the first year of the graduate orthodontic program. A course designed to give the student the clinical training necessary to treat orthodontic problems.

DENT 558. *Orthodontic Seminar.* ★3 (0-3s-0). A continuation of DENT 552 for students in the first year of the graduate program. A course in orthodontic theory.

DENT 601. *Advanced Pedodontics.* ★11 (1-0-9).

DENT 640. *Advanced Complete Denture Prosthodontics.* ★11 (1-0-9).

DENT 641. *Advanced Removable Partial Denture Prosthodontics.* ★8 (1-0-6).

DENT 643. *Maxillofacial and Surgical Prosthetics.* ★3 (First Term, 1-0-3).

DENT 650. *Clinical Orthodontics.* ★24 (6-18c-0; 0-18c-0). A continuation of DENT 550 for students in the second year of the graduate Orthodontic program.

DENT 652. *Advanced Orthodontic Seminar.* ★10 (0-4s-0; 0-6s-0). This course is a continuation of DENT 552. In the Second Term the seminars focus on post retention cases and a review of current literature relevant to orthodontics.

DENT 657. *Clinical Orthodontics.* ★6 (0-18c-0). A continuation of DENT 650 for students in the second year of the graduate orthodontic program. A course designed to give the student the clinical training necessary to treat orthodontic problems.

DENT 658. *Orthodontic Seminar.* ★3 (either term, 0-3s-0). A continuation of DENT 652 for students in the second year of the graduate program. An advanced course in orthodontic theory.

69.3 D.H. Diploma

69.3.1 GENERAL INFORMATION

In the following list of courses open to students in the Dental Hygiene Program, each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

The courses are listed in subject order.

Following the title of each course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages.

The figures, enclosed in parentheses, indicate the total hours of instruction in the course. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. COURSE DESCRIPTIONS OUTLINED BELOW ARE THOSE COURSES OFFERED DURING THE 1980-81 SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

69.3.2 DENTAL HYGIENE COURSES

D HYG 203. *Dental Anatomy.* ★3 (First Term, 39 hrs.). A self-study course that is concerned with nomenclature, biologic considerations of tooth form and function; permanent and deciduous teeth are studied in detail.

D HYG 205. *Dental Radiography.* ★2 (Second Term, 32 hrs.). An introductory course covering the history of dental radiography as well as lectures in radiation physics, radiobiology, radiation control and radiation hygiene. Common types of radiographic films and film characteristics will be discussed as well as photographic chemistry and methods of processing. Projection geometry, principles of dental radiography and normal radiographic anatomy as it relates to identification and mounting of radiographs will be stressed. Each student will also rotate through the clinics in the Second Term for preclinical experience.

D HYG 212. *Dental Auxiliary Practice I and II.* ★14 (273 hrs.). A lecture, pre-clinic and clinical course that integrates the knowledge and practice of dental hygiene skills, dental assisting skills, dental practice management and administration. An experiential approach to the prevention of dental diseases, including individual patient instruction in oral physiotherapy. Special emphasis on the theories and practice of periodontology. Each student will receive a basic course in cardio-pulmonary resuscitation.

D HYG 213. *Anatomy and Physiology.* ★6 (130 hrs.). Basic human anatomy, physiology, and histology; the normal functions of the body with particular emphasis on head and neck.

D HYG 220. *Nutrition.* ★2 (First Term, 26 hrs.). An introductory course. Importance of food nutrients for good general health as well as dental health. Nutrient requirements for an individual at various phases of the life cycle. The art of diet counselling and diet assessment techniques are demonstrated.

D HYG 222. *Oral Histology and Embryology.* ★3 (Second Term, 52 hrs.). The histological development and structural characteristics of the head, face, oral cavity, and teeth. General study of the elementary body tissues and structures to supplement the introduction to histology in D HYG 213.

D HYG 223. *Dental Materials.* ★4 (Second Term, 65 hrs.). The properties, preparation, and manipulation of materials used in dentistry. Laboratory work includes student participation in the taking and pouring up of impressions, fabrication of trays, the placing and carving of restorations, investing and casting, as well as the manipulation of waxes, cements, gold, amalgam, perio pack, etc.

D HYG 227. *Periodontology for the Dental Hygienist.* ★1 (Second Term, 13 hrs.). A lecture and demonstration course designed to introduce the student to those procedures that are commonly associated with the practice of periodontics. Lectures on the classification of periodontal disease, the objectives of periodontal therapy and on how to assess periodontal conditions are also included. A periodontal clinical association with dental students will also take place on a clinic rotation basis.

D HYG 301. *Communications.* ★3 (Second Term, 26 hrs.). Lectures and workshops designed to introduce the student to various communication models useful in interpersonal communications with groups and individuals. Principles of procedures, and preparation and presentation of topics for public speaking, common parliamentary procedures, debating, chairmanship and panel discussions.

D HYG 302. *Pathology.* ★3 (First Term, 52 hrs.). Introduction to the principles of pathology with consideration of the more common diseases affecting the human body. Visual differentiation between normal and abnormal tissues; the physiological and pathological changes which affect the teeth, their supporting structures and the oral mucosa, including oral manifestations of selected systemic disturbances.

D HYG 305. *General Pharmacology.* ★2 (First Term, 26 hrs.). General principles of therapeutics and the pharmacological effects of medication, classified by the responses of organ systems of the body. The beneficial and adverse effects of drugs; the application of the following drug groups: local and systemic anti-infectives, sedatives, hypnotics, stimulants, anti-convulsants, analgesics, psychotherapeutic agents, anaesthetics, cardiovascular drugs, anti-coagulants, coagulants, blood forming agents and replacements, hormones, enzymes, and nutritional agents. Dental and oral therapeutics and therapeutic aids used in dental hygiene. Department of Pharmacology, Faculty of Medicine.

D HYG 312. *Dental Auxiliary Practice III and IV.* ★6 (78 hrs.). A continuation of Dental Auxiliary Practice I and II with emphasis on dental specialities including oral diagnosis, orthodontics, oral surgery, fixed and removable prosthodontics and pedodontics. Lectures and demonstrations on office emergencies, ethics and laws pertaining to dental auxiliary practice, the role of the profession and its interactions with other professions and agencies constitute this course.

D HYG 314. *Oral Physiology.* ★1 (First Term, 13 hrs.). The physiological functions of the oral structures. Physiological aspects of the periodontal tissue with special emphasis on its innervation, nutrition, and reaction to injuries. Lectures on dynamics of mastication, kinesiology of the masticatory muscles, temporomandibular joint, deglutition, speech, special reflexes involving cranial nerves, receptors of the stomotognathic system, salivary glands, composition of the saliva and its relevance to caries. Oral manifestation of metabolic disease, physiology of pain, infection, and oral habits that affect the physiological functions of the oral cavity.

D HYG 315. *Dental Radiography.* ★2 (26 hrs.). Clinical experience in intraoral examinations on patients as well as processing and mounting radiographs.

D HYG 316. *Dental Auxiliary Practice III and IV.* ★6 (350 hrs.). An advanced clinical course that integrates the knowledge and practice of dental hygiene skills, dental assisting skills, dental practice management and administration. Also, each student will participate in a two week field experience in a mobile dental clinic in a designated area of the province following an assignment in the Dental Auxiliary Utilization clinic.

D HYG 321. *Dental Health Education.* ★6 (117 hrs.). Through lecture, discussion and field experiences, this course is designed to provide an introduction to the principles of dental health education. A review of dental health education concepts for the private practice environment; the procedures for establishing a patient education program; construction and utilization of audiovisual materials and the operation of audiovisual equipment; instructional preparation for group education and application of educational theory to teaching experiences is included.

D HYG 322. *Dental Public Health.* ★2 (First Term, 26 hrs.). The historical and philosophical background of public health; the history of dentistry, the function of dentistry in public health services. The role of the dental health team as related to the concept of community dental health.

D HYG 323. *Biochemistry.* ★3 (Second Term, 39 hrs.). This course is designed to provide the students in the dental hygiene program with a general understanding of biochemical concepts. In addition, certain topics in oral biochemistry are considered.

69.3.3 BACTERIOLOGY

BACT 422. *Bacteriology.* ★3 (First Term, 40 hrs.). An introduction to general bacteriology, aspects of infection and resistance, selected examples of infectious disease. Special bacteriology of the mouth including dental caries and periodontal diseases.

69.3.4 ENGLISH

ENGL 210. *English Literary Forms.* ★6 (78 hrs.). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction. Department of English, Faculty of Arts.

69.3.5 PSYCHOLOGY

PSYCO 260. *Basic Psychological Processes.* ★3 (Second Term, 39 hrs.). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. Faculty of Science.

69.3.6 SOCIOLOGY

SOC 202. *Introductory Sociology.* ★6 (78 hrs.). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The process whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Department of Sociology, Faculty of Arts. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

Faculty of Education

71 INTRODUCTORY

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F. M. MacCANNELL, Ph.D.
G. V. MALICKY, Ph.D.
P. A. PAYNE, M.Ed.
P. J. PLATT, M.Ed.
P. H. RAFFERTY, M.Ed.
D. J. SANDE, Ph.D.
S. A. THERRIEN, Ph.D.
D. G. TUCKER, Ph.D.
J. VALLANCE, M.A.
J. WRIGHT, M.S.
J. H. YOUNG, Ph.D.

Assistant Professors

D. A. DILLON, Ph.D.
H. G. ILOTT, B.Ed.
M. L. McNAY, Ph.D.
J. T. PATRIE, Ph.D.
D. J. SEARLE, M.A.

Administrative Officer

E. J. GRAHAM, M.Ed.

71.1.6 DEPARTMENT OF SECONDARY EDUCATION

Professor and Chairman

T. T. AOKI, Ph.D.

Professors

K. L. BOWERS, Ph.D.
K. G. JACKNICKE, Ph.D.
H. J. KASS, Ph.D.
T. E. KIEREN, Ph.D.
R. N. MacGREGOR, Ph.D.
R. G. MARTIN, Ph.D.
M. J. MONOD, Ph.D.
M. A. NAY, Ph.D.
C. Y. OH, Ph.D.
A. T. OLSON, Ph.D.
D. V. PARKER, Ph.D.
S. E. SIGURDSON, Ph.D.
A. A. SMITH, DMA
M. F. R. SMITH, Ph.D.
M. J. van MANEN, Ph.D.

Associate Professors

A. H. BORYS, Ph.D.
W. BROUWER, Ph.D.
T. O. CRAIG, M.A.
D. G. ENGEL, Ed.D.
J. J. LAFOLLETTE, Ed.D.
V. M. LEFEBVRE, Ph.D.
J. E. OSTER, Ph.D.
E. L. RANKIN, Ed.D.
W. D. SAMIRODEN, M.Sc.
S. D. UBELACKER, Ph.D.

Assistant Professors

L. S. BEAUCHAMP, Ed.D.
W. D. HRYCHUK, Ph.D.
J. B. PARSONS, Ph.D.

71.1.7 DEPARTMENT OF INDUSTRIAL AND VOCATIONAL EDUCATION

Professor and Chairman

H. D. TICHENOR, Ph.D.

Professors

J. E. GALLAGHER, Ed.D.
M. W. PETRUK, Ph.D.
C. H. PREITZ, Ed.D.
K. PUFFER, Ed.D.
D. R. YOUNG, Ph.D.
H. R. ZIEL, Ed.D.

Associate Professors

A. K. CLARK, Ph.D.
D. J. COLLETT, M.Ed.
A. K. DEANE, M.Ed.
J. F. D ILOTT, Ph.D.
A. MEYERS, Ph.D.

Administrative Officer

G. D. KENDAL, B.A.

71.1.8 SUPPORTING SERVICES

Audiovisual Media Centre Co-ordinator

K. L. BOWERS, Ph.D.

Administrative Officer

D. A. MAPPIN, B.A.

Centre for the Study of Postsecondary Education Co-ordinator

A. G. KONRAD, Ph.D.

Curriculum Laboratory Co-ordinator

L. G. WIEDRICK, Ed.D.

Administrative Officer
H. HOEKSTRA, M.Ed.

Research Services Division Co-ordinator
S. M. HUNKA, Ph.D.

Faculty of Education Clinical Services Co-ordinator
J. G. PATERSON, Ed.D.

71.1.9 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President of the University
M. HOROWITZ, Ed.D.

Representative, Alberta Teachers' Association
N. P. HRYNYK

Other Members
B. J. BUSCH, Education Librarian

Registrar of the University
W. A. BLANCHARD

Education Students' Association
D. SHIELDS
J. WILSON

Graduate Students' Association
J. C. McMURCHY-DAWSON

Faculties
J. KUSPIRA (Science)
H. C. YOUNG (Business Administration and Commerce)
E. A. DONALD (Home Economics)
R. L. CAREY (Nursing)
J. F. FORREST (Arts)
H. HEBERT (Faculté Saint-Jean)
J. N. NEELLEY (Rehabilitation Medicine)
H. W. ROBERTS (Extension)
S. E. WRIGHT (Library Science)
J. WATKINSON (Physical Education)

71.2 *General Information and Important Deadlines*

The Faculty of Education provides professional preparation for teachers and graduate study opportunities for those interested in more specialized advanced work in the field of education. Undergraduate teacher preparation programs are available for those anticipating careers in preschool, elementary, secondary or post-secondary / adult education.

Each program for the Bachelor of Education degree provides for certification to practice as a teacher in Alberta. Certificates are granted by the Minister of Education, on the recommendation of the Faculty of Education. *Student Visitors (persons on student visas) will not be recommended for certification.*

Inquiries should be addressed to the Office of the Associate Dean (Student Services), Faculty of Education, The University of Alberta.

71.2.2 IMPORTANT DEADLINES

(a) Admission to the University — All programs:
September term — June 1
January term — November 2

(b) Transfer to the Faculty of Education from another faculty in the University:
For September admission — June 1
For January admission — November 2

NOTE: Students who registered in another faculty in September may not transfer in January, Spring Session or Summer Session, unless the requirements of the program to which admission is sought warrant an immediate transfer.

(c) Advance Registration:
Continuing students in B.Ed., B.Ed. / A.D., Graduate Diploma Programs — March 15
New students or transfers from other faculties must register in-person in September.
On-campus evening credit — June 1

(d) Withdrawal from University:
Formal notice is required. See 15.2.5 of University Regulations and Information for Students Calendar for fee assessment.

(e) Addition of courses to student's program or changing from "audit" to "credit".
Full Session and First Term courses — September 17
Second Term courses — January 11

(f) Dropping courses from a student's program or changing from "credit" to "audit".
(i) For students who are *not* registered in a 6 or 10 week practicum-related course:
First Term courses — November 12
Full Session courses — February 12
Second Term courses — March 1
(ii) For students who *are* registered in a 6 or 10 week practicum-related courses:

Last date for withdrawing from First Term courses will be:
First 6 weeks — October 5, 1981
Second 6 weeks — November 16, 1981
Ten weeks — October 19, 1981

Last date for withdrawing from Second Term courses will be:
First 6 weeks — February 1, 1982
Second 6 weeks — March 15, 1982
Ten weeks — February 15, 1982

(g) Application for regular supplemental or deferred final examinations:
To be written August 4-8 — July 3
To be written after First Term — March 17

(h) Application to receive a degree:
At Spring Convocation — February 1
At Fall Convocation — July 15

(i) Readmission after a failed year:
Notification to Faculty and to Student Counselling Services that readmission for Fall Session is being sought — July 15.

NOTE: Normally one year must elapse before readmission is sought.

71.3 *Board of Teacher Education and Certification*

A Board of Teacher Education and Certification representing jointly the Department of Education, the Universities of Alberta, Calgary and Lethbridge, the Alberta School Trustees' Association, the Conference of Alberta School Superintendents, the Alberta Teachers' Association and the Department of Advanced Education and Manpower serves as a liaison body for the groups it represents. This board is purely an advisory body. It is authorized to make recommendations to the Minister of Education and to the President of the University respecting the programs of instruction, the estimates of expenditures on these programs, regulations governing the certification of teachers prepared in Alberta or elsewhere, and appointments to the staff of the Faculty of Education.

72.1 Admission

72.1.1 ADMISSION REQUIREMENTS

(1) *Academic Requirement.* The matriculation requirements for all B.Ed. programs are set out in § § 13.1 and 13.8 of the University Regulations and Information for Students Calendar.

(2) *Non-matriculated Adult Applicants.* Residents of Alberta, who are Canadian citizens or Permanent Residents (Landed Immigrants) and who do not meet the regular matriculation requirements may qualify for admission to the Faculty of Education by meeting the requirements outlined below:

(a) Applicants must be twenty-one years of age by December 31st in the calendar year in which admission is sought.

(b) Applicants must present to the Office of the Registrar a high school transcript indicating credit in English 30 and one of: Biology 30, Chemistry 30, French 30, German 30, Latin 30, Mathematics 30, Mathematics 31, Physics 30, Social Studies 30, or Ukrainian 30. A minimum mark of 50% in any one course and an average of 60% in the two courses presented for admission is required.

(c) Applicants should communicate with Student Counselling Services (telephone 432-5205) for testing and an interview. A positive recommendation is required from Student Counselling Services.

(3) *Vocational Education Route.* To gain admission to a B.Ed. program, vocational education route, a student must meet special admission requirements. These requirements are outlined in detail in § 73.5.1. A student might present the following modified matriculation pattern:

(1) English 30
(2) Subject from Group A or C
(3) Subject from Group A or C
(4) Vocational Education 32 subject
(5) Vocational Education 32 subject

The average on (1), (2), and (3) must be at least 60% with no grade below 50%. The average on (4) and (5) must be at least 65% with no grade below 50%.

(4) *Interview.* All students must attend a program counselling session prior to their first registration in the Faculty. First year students may attend the session prior to being admitted. All applicants will be informed of the session time prior to the registration period.

(5) *Speech Test.* Since competence in spoken English is a requirement of admission to the Faculty of Education, a speech test is required of all applicants for first admission. This test is over and above the English language proficiency requirement outlined in § 14.3 of the University Regulations and Information for Students Calendar. Students must sign up for the speech test during the first In-Person Registration period. Registration in Education Practicum courses will not normally be permitted unless speech clearance has been obtained.

(6) *Application deadlines.* Normally preference will be given to students who apply early. Students currently on programs in Alberta universities and colleges are urged to apply before May 1st to ensure admission the following September. Students should not expect to be informed of their admission status prior to August 1 since all documents must be received and assessed before the admission ruling can be made.

(7) *Holders of Approved Degrees of The University of Alberta.* Students seeking admission to a teacher education program on the basis of an approved degree from The University of Alberta are not automatically entitled to admission to the Faculty of Education. See § 73.8.2 for details of prerequisite requirements for admission to specific programs. Points (3), (4), and (5) above apply. Applicants should complete an Application for Re-enrolment form at the Office of the Registrar prior to June 1 for September admission.

72.1.2 ADMISSION WITH ADVANCED STANDING OR ADVANCED CREDITS

(1) Applicants seeking advanced standing for work completed at institutions other than the University of Alberta must have their transcripts evaluated by the Office of the Registrar. The transcripts should be submitted to the Registrar, The University of Alberta, Edmonton.

(2) A maximum of ten full course equivalents (60 credits) may be granted for work completed at other institutions. Applicants should not expect to receive more than 60 credits which is the maximum amount of advance credit that will be granted. However, the amount of credit will depend upon the program elected by the applicant.

(3) Students entering the Faculty of Education with advanced standing who expect to teach in Alberta should obtain an evaluation for salary purposes from the Teacher Qualification Service, A.T.A., Barnett House, 11010 - 142 St., Edmonton, Alberta, T5N 2R1. An evaluation for salary purposes does not necessarily agree with an evaluation for admission purposes.

72.1.3 ADMISSION WITH EXTRAMURAL CREDITS

Credit to a maximum of four junior courses (24 credits) taken by correspondence from another recognized university may be allowed, although the actual number will vary with the program.

72.1.4 APPLICATION FOR ADMISSION

Application procedure is explained in § 14 of the University Regulations and Information for Students calendar.

No definite and final ruling concerning admission can be given until all certificates and transcripts of standing have been reviewed by the Office of the Registrar. Final decisions on admission status will not be made until August 1 or later, depending upon the receipt of documents. It is the applicant's responsibi;ity to ensure that the University receives all documents.

72.1.5 RE-ADMISSION

A candidate returning to the Faculty of Education after a break of twelve months or longer in his or her program should request and complete Re-enrolment Forms and submit them to the Registrar's Office.

72.1.6 RE-ENROLMENT ON TRANSFER

A student transferring into the four-year B.Ed. program of the Faculty of Education from another faculty within the University of Alberta should request and complete Re-enrolment Forms and submit these to the Registrar's Office, before June 1, for September admission; before November 2 for January admission.

72.1.7 RESIDENCE REQUIREMENTS

A student proceeding towards the B.Ed. degree must complete a minimum of two years (60 credits) in the

Faculty of Education. Students should be aware that, because of the highly structured nature of the program, full-time attendance will be mandatory at different points in the degree program.

72.2 Registration

(1) *Registration Procedure.* The procedure for registration is that set out in § 15 of the University Regulations and Information for Students calendar.

(2) The normal course load each term of the Winter Session is 15 credits. Students may be permitted to do 18 credits each term if they:

(a) Have an average of 7.5 or better on the last 30 credits already recorded for work done in the Faculty of Education. (First Term grades will not be considered in calculating the G.P.A. of 7.5.)

(b) Have a G.P.A. of 6.0 or better and will meet graduation requirements during the Winter Session in which the extra courses are requested.

STUDENTS REGISTERED IN EXTENDED PRACTICUM EXPERIENCES (4-10 WEEKS) ARE RESTRICTED TO THE NORMAL LOAD.

(3) *Registration in Practicum.* Students with problems related to health, speech or any other disability are advised to consult with the Assistant Dean (Practicum) prior to enrolling in education practicum courses since some adjustment in assignment may be necessary.

72.2.1 CHANGE OF REGISTRATION

A student wishing to change his or her registration, including "Audits", must apply to the Student Records Office of the Faculty of Education. No credit will be granted in a course unless a student is officially registered in the course prior to the published deadline. Please refer to the Academic Schedule for deadlines and to § 71.2.2 of this calendar.

72.2.2 WITHDRAWAL FROM FACULTY

Once a student has registered in the faculty, 'Notice of Withdrawal' forms must be completed if the student decides not to attend. Fees will be assessed according to the regulations and dates outlined in 15.1.5, 15.1.15, and 15.2.5 of the University Regulations and Information for Students calendar and the appropriate section of the In-person Registration handbook.

72.3 Academic Standings and Graduation

(1) The pass mark in all courses in both degree and certification programs is a grade of 4. For admission to a course with a prerequisite requirement a grade of at least 4 must be obtained in the prerequisite course.

(2) *Categories of Academic Standing.* There are three categories of academic standing, designated as categories (A), (B), and (C). These categories are determined for each student by the computation of a Quality Index upon the completion of each year of study. The Quality Index (Q.I.) is defined by the following formula:

$$\text{Q.I.} = \frac{\text{Number of Courses Passed}}{\text{Number of Courses Attempted}} \times \text{G.P.A.}$$

In the above formula, G.P.A. (Grade Point Average) is the sum of the products of all grades and their respective course weights divided by the sum of those weights.

The categories of standing are as follows:

Category A: All students with a Q.I. of 4.0 or greater.

Category B: All students with a Q.I. of less than 4.0 but greater than 2.0. Performance in this Q.I. range is considered to be "unsatisfactory."

Category C: All students with a Q.I. of 2.0 or less. Performance at this level is considered to be "extremely unsatisfactory." Students in this category at the end of a year's work will be required to withdraw from the faculty. When a student has been required to withdraw, normaliy at least a year must elapse before readmission will be granted. All applications for readmission after a requirement to withdraw must be accompanied by a recommendation from the Student Counselling Services.

(3) To obtain a Bachelor of Education degree a student must present a grade of 4 or better in a minimum of eighteen full-course equivalents (108 credits), not less than a grade of 3 in the other two full course equivalents (12 credits), except that a grade of 3 is not acceptable in the area of specialization, and a grade-point average of at least 5.0 in all courses credited to the degree after the first year. i.e. the last 90 credits.

(4) To qualify for a Bachelor of Education degree "With Distinction" students must complete the final 60 credits at this university with a grade-point average of 7.5 or higher. Students who complete 3 or more credits of the last 60 credits at another institution will not be eligible for the degree "With Distinction".

(5) To be recommended for the first certificate a student must obtain a grade-point average of at least 5.0 on all courses credited toward the certificate.

(6) A student transferring to the B.Ed. program at The University of Alberta with more than 30 credits must obtain a grade-point average of at least 5.0 on all courses completed at The University of Alberta for credit towards his/her degree.

(7) A holder of an approved degree may not obtain credit for more than one full course equivalent (6 credits) with a grade of 3.

(8) A student will not be allowed to write supplemental examinations on more than two full course equivalents (12 credits) in any one year.

(9) A student will not be allowed to write supplemental examinations on more than five full course equivalents (30 credits) on the four-year B.Ed. program.

(10) A holder of an approved degree taking the B.Ed. program will not be allowed to write supplemental examinations in more than two full course equivalents (12 credits).

(11) A teacher who, during the regular Supplemental Examination period, is in a teaching position may, with the approval of the Dean, write the supplemental examination at the end of the Summer Session. If an examination in the required subject is on the regular schedule, the fee for the supplemental is $15.00. If a special examination paper must be prepared, the fee is $60.00.

(12) A student who fails a course in the Spring or Summer Sessions will not be granted a supplemental privilege.

(13) There is no supplemental privilege in education practicum courses.

(14) A student who, in any Winter Session, is unable to complete Student Teaching because of Faculty regulations based on School Board policies will be required to withdraw from Student Teaching and

re-register in the appropriate Student Teaching (ED PR) course in a subsequent year.

(15) A student will not be granted the privilege of repeating a failed course more than once during the degree program.

(16) A student who is repeating a year will be granted no supplemental privileges in the courses taken in that year and must pass all courses with a minimum grade of 4 and with a grade-point average of at least 5.0 in order to be allowed to continue.

(17) The maximum number of additional courses including repeated courses in which a student may enrol during a B.Ed. program may not exceed by more than five the number of courses required for completion of any B.Ed. program.

(18) Special regulations applying to particular routes to the B.Ed. degree are set out in § 73.

(19) The Faculty of Education has an Academic Appeals Committee, similar to the General Faculties Council Academic Appeals Committee. Matters regarding a student's academic status may become the subject of an appeal, with the exception of marks in individual courses.

Students who wish to discuss grades which they receive should consult first with the professor offering the course and then with the Chairman of the Department offering the course. See also § 16.7 (Appeals and Grievances) in the University Regulations and Information for Students Calendar.

72.4 Special Regulations

(1) *Transfer from one route to another.* Students who wish to change their route should consult with personnel in the Office of the Associate Dean (Student Services). Route changes are possible but students must expect to meet all of the requirements of the new route. This may involve additional course work.

(2) *Advance Credits for Certificated Teachers.* Normally one year's credit in the four-year program is given for basic teacher education programs.

(3) *Review of Inactive Programs.* A student whose B.Ed. program has been inactive for three years or who has failed to complete the degree in fifteen years may have his/her program reviewed and, if necessary, rearranged according to prevailing requirements.

(4) Established students who expect to receive credit on their University of Alberta program in the Faculty of Education for a course completed elsewhere must get prior permission in writing from the Associate Dean (Student Services).

(5) *Transfer from Probationary Status.* Program changes which occur in the B.Ed. degree program while a student has probationary status will be applied. Therefore, the degree requirements which are in effect at the date of admission to the B.Ed. degree program will be applicable.

72.5 Certification

NOTE: ALL STUDENTS ENTERING THE FACULTY OF EDUCATION IN SEPTEMBER, 1973, OR LATER MUST COMPLETE EITHER:

(a) the four-year B.Ed. degree or

(b) the certification requirements of The University of Alberta for the holder of an approved degree,

BEFORE BEING RECOMMENDED TO THE DEPARTMENT OF EDUCATION FOR A TEACHING CERTIFICATE.

72.5.1 GENERAL INFORMATION

Alberta teaching certificates are issued only by the Department of Education of the Province of Alberta. The Faculty of Education recommends students who have completed certification requirements of the faculty to the Department of Education for the teaching certificate to which they are entitled. For further details of the regulations respecting certification of teachers students should write to The Registrar, Department of Education, Devonian Building, 11160 Jasper Avenue Edmonton. A pamphlet is available on request. New persons with Student Visitor (Student Visa) status will not be recommended for certification.

73 PROGRAMS OF STUDY

73.1 The Degree of B.Ed.

73.1.1 GENERAL INFORMATION

Underlying Principles

The following principles underlie teacher preparation programs in the faculty:

1. The B.Ed. degree consists of a minimum of 120 credits.

2. A number of alternative programs should be available in order to accommodate the individual differences in the motivation, knowledge, career objectives and preferred learning styles of students and the differing perspectives, preferences and approaches in the field of education which are reflected in the Faculty.

3. The activities, courses and programs of the Faculty should be satisfying and meaningful to students.

4. The education of a teacher is a continuous, lifelong process. In addition to emphasizing basic or fundamental preparation, the initial pre-service experience should aid the development of attitudes which will encourage self-evaluation and improvement and the acquisition of the knowledge and skills which will facilitate life-long learning.

5. Skills and knowledge essential to successful teaching should be an important part of all of the Faculty's teacher preparation programs. These various elements are identified within, and guaranteed by, the component model.

6. Teacher preparation is a multi-partner multi-faceted endeavor. The various partners, including all departments of the Faculty, numerous other departments of the university, and the profession, through their collective involvement, should provide intending teachers with essential practical skills, a knowledge of theory and its relationship to practice, liberal studies and subject-matter competence.

7. Intending teachers should experience in their professional preparation, exemplary models of a variety of teaching styles and modes of effective instruction. This implies that differing methodologies and techniques should be utilized in the education of teachers in the Faculty.

8. The Faculty of Education is committed to the provision of quality teacher preparation programs and

recognizes the importance of continuously monitoring, evaluating and refining its offerings so that they adequately reflect changes in society and advances in knowledge.

Program Planning

The Faculty of Education assists candidates with program planning. Preregistration conferences will be held near the end of each academic session. Students currently enrolled will have programs planned at that time to speed the registration process. Candidates failing to preregister may be required to enrol after classes have begun, a lengthy and more extended procedure. Candidates with special problems may schedule interviews with one of the academic officers in the Office of the Associate Dean (Student Services).

It is the candidate's responsibility to be acquainted with all rules and regulations and to meet the requirements for his/her degree as outlined. Any exceptions to the requirements must be approved in writing by the Associate Dean (Student Services) with one copy to be placed in the candidate's file and one to be given to him/her.

Students who were admitted between September 1, 1973 and September 1, 1977, will normally follow the program outlined in the calendar of the year which they were admitted.

Students admitted to the faculty September 1, 1977, or beyond will be required to complete thirteen (13) weeks (full days) of practicum in order to be recommended for the teaching certificate. Program modifications as necessary will be imposed in order for students who were admitted in 1977 and 1978 to meet this requirement.

Students entering the faculty in September, 1979, must meet the requirements adopted by the Faculty of Education in June of 1979. The general requirements of that program are outlined in subsequent sections of this calendar.

Students must register in one of the following routes: Elementary, Secondary, Industrial Arts or Vocational Education.

For holders of approved degrees, § 73.8 gives details concerning the requirements for admission and certification.

Students who hold a Professional Teaching Certificate and an approved degree should consult § 73.9 for information about advanced study in Education.

73.2 Elementary Education Route

73.2.1 GENERAL

The broad goal of the elementary education route is to prepare subject generalists who can teach all children normally found in elementary school classrooms K — 6.

The program has several components, with varying numbers of courses or credits, which are directed toward the broad and specific goals.

I. *NON-EDUCATION* (Courses in other faculties of the University)

The object of this component is to provide a liberal or general education background for the prospective elementary school teacher. Students are required to take courses in seven different elements of the Non-Education component: *Canadian Studies, Fine Arts, Language and Literature, Mathematics, Natural Science, Physical Education, Social Science.* These elements and the remaining courses are to be planned by students *with faculty advice.* To assure some depth in academic study, a minimum number must be senior courses (numbered 300 or above).

II. *BASIC EDUCATION*

Courses in three departments, Educational Foundations, Educational Psychology and Educational Administration, constitute the Basic Education component.

Study in *Educational Foundations* is designed to provide students with a socio-historical understanding of Canadian Education and an opportunity to study important theoretical questions through one of the recognized disciplines.

Required study in *Educational Psychology* focuses on child/adolescent development and learning theory and their implications for diagnosing the needs of learners.

In *Educational Administration* study is concerned with the legal, organizational and professional aspects of a teacher's role.

III. *ELEMENTARY EDUCATION CURRICULUM AND INSTRUCTION*

In this component, courses are focused on general teaching strategies, curriculum and instruction related to several specific subject areas, and the shaping of these ideas as related to particular groups of children.

IV. *FIELD EXPERIENCES/PRACTICUM*

There will be field experiences throughout the program and three levels of practicum. The practicum, a total of 13 weeks, begins in Year I and is completed in a professional year later in the program.

V. *ELECTIVES*

Opportunities for student choice include an Elective Package designed to develop further competence in an area of school instruction, or to develop a focus which would integrate learnings from several disciplines. Descriptions of Elective Packages available will be provided to students with other counselling information. Some packages may be distributed over the 4 years of the program and offered only at the U. of A.

In addition to the package, there will be some limited opportunity for options in Education.

In summary, the program consists of a total 120 — 123 credits in the five program components.

Other important features of the program are found in the program organization. Groups of students will study together with teams of staff to promote collegiality and shared learning. Terms and courses are carefully sequenced to enable maximum integration of learnings. Core skills and knowledge are introduced early and culminated in the final year. To achieve these ends the program has limited entry points.

Students Registering on Generalist Programs:

Year I

ED PR 251 and nine three-credit or half-courses in Non-Education. The Non-Education selections should be made with Faculty advice, using information to be provided in counsellig sessions.

Year II (1981-82)

EDFDN 201
EDPSY 263
ED CI 215
Non-Ed. — 15 credits

Years III and IV

Program will include practicum in one professional year, or in two professional terms, requiring attendance for full days. Senior courses in all components and the electives will be part of the final two years.

73.2.2 TEACHING SPECIALIZATIONS ELEMENTARY EDUCATION ROUTE (FOR STUDENTS ADMITTED PRIOR TO SEPTEMBER, 1979)

The following information on the requirements for the teaching specializations apply only to those students admitted to elementary education programs prior to September 1, 1979. All other students must meet the requirements set forth in the generalist model.

TABLE I

ART
I (i) ART 231
(ii) and (iii) *Two* full course equivalents as approved by subject area advisers.
II (i) ED CI 336
(ii) ED CI 437

ENGLISH (Language Emphasis)
I (i) *One* full course equivalent in Literature
(ii) *One* full course equivalent about Language
(iii) *One* senior full course equivalent in Literature or Language
II (i) ED CI 229 or 329
(ii) *One* of ED CI 329, 429, 430
(iii) *One* of ED CI 224 or 323, 423, 424, 425

ENGLISH (Reading Emphasis)
I (i) *One* full course equivalent in Literature
(ii) *One* full course equivalent about Language
(iii) *One* senior full course equivalent in Literature or Language
II (i) *Two* of ED CI 224 or 323, 423, 424, 425
(ii) *One* of ED CI 229, 329, 429, 430

MATHEMATICS
I (i) Mathematics 221/one-half approved mathematics course
(ii) Mathematics 375/328
(iii) *One* full course equivalent in mathematics.
II (i) ED CI 216
(ii) ED CI 416
(iii) ED CI 417

MUSIC
I (i) Music 250/251
(ii) Music 304, 330
(iii) *One* full course equivalent as approved by subject area adviser.
II (i) ED CI 339
(ii) ED CI 439
(iii) ED CI 440

PHYSICAL EDUCATION
I (i) MOV 201/202
(ii) MOV 321/325
(iii) MOV 327/351
II (i) *One* of MOV 227, 231, 251
(ii) *One* of MOV 369, 379, 389
(iii) MOV 437

SCIENCE
I Minimum of *three* Science full course equivalents offered in the Faculty of Science, at least *two* of which must be laboratory courses from *two* different fields.
II (i) ED CI 220
(ii) ED CI 320
(iii) ED CI 420
(NOTE: First year course selection should be discussed with adviser.)

SECOND LANGUAGES
French
I (i) French 201 or 230
(ii) French 301
(iii) French 313, 314
II (i) ED CI 308
(ii) ED CI 408

Other Languages
I (i) The student should consult with the Department.

SOCIAL STUDIES
I (i) Two half courses in history or social sciences which focus primarily on Canadian content.
(ii) and (iii) *Two* full course equivalents as approved by subject area advisers.
II (i) ED CI 212
(ii) ED CI 412
(iii) ED CI 413
(NOTE: First year course selection should be discussed wit adviser.)

EARLY CHILDHOOD EDUCATION
I (i) A minimum of *three* full course equivalents in *one* of th subject matter areas such as Mathematics, English, etc
(ii) A minimum of *three* full course equivalents to be selecte from at least *three different* areas from the following:
(a) ART 231, 312, 322, 362, 372, ART H 304/35 306/356;
(b) Drama 245, 251, 253, 321;
(c) English 305, 306, 398, Library Science 412, 432;
(d) Family 350 or Sociology 371: Family 343, 442, 44 448, 449, 543, 551;
(e) MOV 201, 301, 423, 433;
(f) Music 210, 305, 307.
(NOTE: First year students should choose *one* full cours equivalent from (i) *and* (ii) above.)
II (i) ED CI 404
(ii) *One* half course to be selected in Language, (i.e., *one* ED CI 229, 329, 429, 430)
(iii) *One* half course in Reading (ED CI 224 or 323, 424)

SPECIAL EDUCATION
I (i) A minimum of *three* full course equivalents in *one* of th subject matter areas such as Mathematics, English, etc
(ii) Educational Psychology 251 *and* 253
(iii) Educational Psychology 351 *and* 355
(iv) Educational Psychology 357 *and* 361
(v) Educational Psychology 461 *and one* of Educational Ps chology 453 *or* 459
(NOTE: First year students should choose *one* full cour equivalent from (i) above *and* EDPSY 251 *and* 253.)

73.2.3 STUDIES IN INTERCULTURAL EDUCATION

The B.Ed. program provides an opportunity f students to undertake special studies in Intercultur Education program. These studies are designed to pr pare teachers for service in areas where other culture prevail, such as Indian, Metis, and Eskimo commun ties, or third-world countries. The student must cor plete a prescribed pattern of courses and must be pr pared to accept a practicum experience in cross-cultural setting.

1. *Selection of Courses.* During the four years of th B.Ed. program, the Intercultural Education student mu complete the four full course equivalents (selecte from the areas) listed below:
(a) Social Sciences — Two half-courses, Anthrop ogy 307 and Anthropology 308.
(b) Curriculum and Instruction — Two half-courses the area of teaching Engliish as a second languag ED CI 309 and ED CI 409.
(c) Two full course equivalents in a special intere area (either theoretical areas or cultural are such as native peoples, Latin America, etc.).

2. At the request of the student, the intercultu focus will be recognized by a letter from the De stating that the student has completed the course r quirements in Intercultural Education.

3. Any student interested in Intercultural Education advised to consult the Coordinator of the Intercultu Program, Department of Educational Foundations. T coordinator must approve all programs.

73.3 Secondary Education Route

73.3.1 GENERAL

The Secondary Education route provides the use two professional terms. The first professional term v take place during year two or three. Four courses v

be taken during the first ten weeks of the term and will be followed by a four week full-day practicum experience (Phase II)

The second professional term will take place during year three or year four. Three courses will be taken on campus interspersed with two rounds of full day practicum experiences consisting of four weeks each (Phase II).

For those students who have specialization courses which are comprised almost entirely of full-year courses, e.g., Art and Drama, it may be necessary to take Phase II and Phase III of the practicum during the same academic year, that is, Phase II during term one and Phase III during term two.

NOTE: All students who require or plan to take full year courses should take these courses in year one or two where possible.

73.3.2 TEACHING SPECIALIZATIONS SECONDARY EDUCATION ROUTE

Six full course equivalents (36 credits) for a teaching specialization are required on the secondary education route. Students must choose an area of specialization from the following:

- Art
- Biological Science
- Business Education
- Drama
- English
- General Sciences
- Home Economics
- Mathematics
- Modern Languages (French, German, Slavic Languages)
- Music
- Physical Education
- Physical Sciences
- Social Studies.

Provision may also be made for a 'Second Teaching Specialization' (minor). It is expected that almost all students will choose a second area of teaching from either a subject discipline, or an area identified as a non-subject area specialization.

Students will choose a second area of teaching from the subject areas as listed under the teaching specialization. A minimum of three full course equivalents (18 credits) in the subject area will be required for the second area of specialization. One-half course (3 credits) of the 18 credit total *may* be comprised of a Curriculum and Instruction course in the field of specialization. The remaining 15 credits will be offered by faculties other than the Faculty of Education.

It is anticipated that there will be developed second areas of specialization that are not subject specific. It is also anticipated that such programs will consist of clusters of courses (up to a maximum of 18 credits) distributed throughout the four year program.

Further information on non-subject area second teaching specializations may be obtained from the Office of the Associate Dean (Student Services).

The following component model will illustrate the areas and credits required for a B.Ed. degree in Secondary education.

Component	*Credit*
Basic Education	
EDPSY 263 and 371	6
EDFDN 201 and a specified 300 level course	6
EDADM 401	3
	15
Practicum*	
ED PR 251 (Phase I)	3
ED PR 353 (Phase II)	3
ED PR 354, 355 356 (Phase III)	9
	15
Curriculum and Instruction	
ED CI 352	3
ED CI (Major area — 300 level)	3
ED CI (Major area — 300 level)	3
	9
Teaching Specialization	
6 full course equivalents	36
Second Teaching Specialization	
2½ full course equivalents	15
½ course subject area C. & I. *or*	
½ course in subject area specialization	3
	18
Senior Elective	3
Options	
4 full course equivalents	
1½ — General Studies	9
2 — Unspecified	12
½ — Education (to be taken concurrently with Phase II)	3
	24
	120

*NOTE: Students enrolled in Practicum courses may have the following changes in their programs:

(a) Final examinations in concurrent lecture courses may be scheduled outside of designated examination weeks.
(b) Students may be required to student teach during designated examination weeks.
(c) Reading Week (Term II) may be moved to coincide with school systems' Spring Break.

ED PR 251 (Phase I), EDFDN 201, and EDPSY 263 can be taken either during Year 1 or Year 2 of the program, but preferably during Year 1. EDPSY 371 and the 300 level specified course in Educational Foundations will be taken concurrently with ED CI 352 and Phase II practicum during either Year 2 or Year 3, preferably Year 2. Phase III practicum and associated Curriculum and Instruction courses (integrated program) will be taken during Year 3 or Year 4, preferably term two of Year 3 or term one of Year 4. The Senior Elective course and EDADM 401 will be offered following the integrated program, preferably during Year 4. The subject area specialization, minor specializations, and options will be distributed throughout the four year program (excluding professional terms).

Outlined below for each teaching specialization (major) and each second teaching specialization (minor) are:

I) a list of courses, elements of which should be chosen to complete requirements for the teaching specialization component.

NOTE A: 36 credits are required on the major component and 18 credits are required on the minor component over the four year program

NOTE B: Unless otherwise indicated, the first course(s) listed are the recommended registration for the first year.

II) those Curriculum and Instruction courses which are required in the area of specialization. (Note: Curriculum and Instruction courses on the major are normally taken with ED PR 354, 355, 356)

ART

Major

I. (i) Art 231
(ii) Art History 201/202 or Art History 306/356
(iii) (iv) and (vi) 24 credits in art and design

NOTE: Up to 6 credits in aesthetics or related area will be acepted as part of the requirement.

II. ED CI 385 and 386

NOTE: Taken with ED PR courses, normally during third year.

Minor

I. (i) Art 231
(ii) Art History 201/202
(iii) 6 credits from art and design *or*
3 credits from art and design plus ED CI 485.

BIOLOGICAL SCIENCES

Major

I. (i) Chemistry 250
(ii) Biology 297 and 299
(iii) Biology 296 and 298
(iv) Biology 301 and 302
(v) and (vi) 12 credits from senior offerings in Biology, Botany, Biochemistry, Entomology, Genetics, Microbiology, Zoology.

II. ED CI 370 and 371

NOTE A: Students must register in (i) and (ii) in first year.

NOTE B: Biology 30 or 130 is a prerequisite for the introductory biology program. Students lacking Biology 30 may take Biology 130 as an option.

Minor

I. (i) Biology 296 and 297
(ii) Biology 298 and 299
(iii) 6 credits from senior Zoology *and/or*
Botany *or* 3 credits from Zoology *and/or*
Botany plus one of ED CI 469, 471, 472 *or* 475.

BUSINESS EDUCATION

Major

I. (i) Economics 201 and 202
(ii) Accounting 202 and EDBUS 341
(iii) Organization Theory 303 and 305
(iv) Legal Relations 311 and EDBUS 357
(v) and (vi) 12 credits from: EDBUS 343, 351, 355, 460, 461, 481, 483, 485; Businss 304; Economics 316, 317; Finance 304; Geography 350; Industrial Relations 304, 401; Managerial Economics 312, 323, 333; Marketing 304; Management Science 357; Psychology 321; FAM 440, LAW 302, 303, 304, or other approved courses in Business Administration and Commerce, Computing Science or Economics.

II. ED CI 378 and 379.

III. EDBUS 485 or one year of previous work experience in business.

Minor

I. (i) Economics 201 and 202
(ii) Accounting 202 and EDBUS 341
(iii) Legal Relations 311 and EDBUS 357

DRAMA

Major

I. (i) Drama 251 and 243
(ii) Drama 275 and 321
(iii) Drama 323 and 353
(iv), (v) and (vi) A theatre history course and 12 credits in approved drama courses from the following: Drama 383, 385, 357, 341, 359, 459, 303, 403.

II. ED CI 389 and 390.

Minor

I. (i) Drama 245
(ii) Drama 251 and 321
(iii) Drama 275 and 323

ENGLISH

Major

I. (i) English 200 or equivalent
(ii) and (iii) 12 credits chosen from senior English courses, 3 credits of which must be in Canadian literature
(iv), ((v) and (vi) 18 credits chosen so that at least 9 are from English 288, 309, 311, 313; Linguistics 303, 382, 416; and the remaining 9 are from other senior English courses, Classics 357, 359, 360; Comparative Literature 300, 371, 372; Interdisciplinary Studies 300; Drama 245, 341; and Library Science 433.

II. ED CI 353 and 354

NOTE: First year students should register in (i).

Minor

I. (i) English 200 or equivalent
(ii) Senior English
(iii) 6 credits from senior English courses, ED CI 348, 349, 452, 453.

GENERAL SCIENCES

Major

I. (i) Two of: Biology 296, 297, 298, 299
(ii) Chemistry 200 or 202
(iii) 6 credits from Biology 296, 297, 298, 299, 301, 302.
(iv) Physics 203 or 205 and 207 or 209
(v) Geology 202 and 203 (or equivalent)
(vi) 6 credits from: Biology (Biology 301 and 302 are recommended), Chemistry, Astronomy, Geology Meteorology, Physics, Physical Geography, Botany Entomology, Genetics, Microbiology or Zoology

II. ED CI 368 and 369

NOTE A: First year students must register in (i) and (ii) above.

NOTE B: Chemistry 200 and 202 are 6 credit courses and should be taken in the first year to avoid timetable problems later registration.

Minor

I. (i) 15 credits from the following four groups with at least credits from 3 of the groups:
(a) Biology 296/297/298/299
(b) Chemistry 200 or 202
(c) Physics 203/205/207/209
(d) Geology 202/203
(ii) One of ED CI 469, 470, 472, 474, 475

HOME ECONOMICS

Major

I. (i) Clothing and Textiles 203 (A student granted advanced placement in Clothing and Textiles 203 must select Clothing and Textiles 307); and Clothing and Textiles 200 or 306
(ii) Clothing and Textiles 300 or 412 and Clothing and Textiles 309
(iii) Family 350 and 440
(iv) Family 343 or 347; and Family 346 or 551
(v) Foods and Nutrition 320 and 321
(vi) Foods and Nutrition 325 or 326; and Foods and Nutrition 327 or 328.

II. ED CI 382 and 383

A *Minor-Foods and Nutrition*

I. (i) Chemistry 250
(ii) Foods and Nutrition 320, 321
(iii) Foods and Nutrition 325, 326; Foods and Nutrition 3 or 328.

NOTE: It is recommended that students wishing to minor Foods and Nutrition begin by taking Chemistry 250 in their fi year.

B *Minor-Clothing and Textiles*

I. (i) One course (3 credits) from each of the follow groups:
(a) Clothing and Textiles 203 and Clothing and Textil 307 or 406
(b) Clothing and Textiles 200 or 400
(c) Clothing and Textiles 300, 412 or 408
(d) Clothing and Textiles 309 or 409
(e) Three additional credits in Clothing and Textiles

NOTE: A student granted advance placement in Clothing a Textiles 203 should select six credits in Clothing and Textiles (e).

C *Minor-Family Studies*

I. (i) Family 350 or Sociology 371
(ii) Family 440
(iii) Family 343 or 347
(iv) Family 346 or 551
(v) 6 credits from Family Studies *other than* Family 359.

MATHEMATICS

Major

I. (i) Mathematics 202 or 203 and Mathematics 204
(ii) Statistics 255
(iii) Mathematics 221 and Mathematics 328
(iv) Mathematics 375; Mathematics 376 or 474
(v) and (vi) 12 credits from Mathematics 222, 302, 303, 361, 362, 376, 415, 416, 427, 474; Computing Science 261, 262 or any senior Mathematics or Computing Science courses or any approved science courses.

II. ED CI 364 and 365

Minor

I. (i) Mathematics 202 or 203 and 204
(ii) Mathematics 375
(iii) 6 credits from Mathematics 221, 328, Statistics 241 plus ED CI 366 or 367.

MODERN LANGUAGES — FRENCH

Major

I. (i) French 201 or 230
(ii) French 301
(iii) Romance Linguistics 372
(iv) French 313 and 314, or French-Canadian 332 and 333
(v) and (vi) 15 credits approved by a subject area advisor.

II. ED CI 356 and 357

Minor

I. (i) French 201 or 230
(ii) French 301
(iii) 6 credits chosen from: Romance Linguistics 372, French 313, 314, French-Canadian 332, 333.

NOTE A: Students who are excused from Romance Linguistics 372 following testing by the Department of Romance Languages are to enrol in Romance Linguistics 375.

NOTE B: Students are advised to take Romance Linguistics 372 concurrent with or following French 301.

MODERN LANGUAGES — GERMAN

Major

(i) One of German 200, 201 or 202
(ii) German 330
(iii) German 350
(iv) German 300
(v) and (vi) 12 credits at the senior level to be approved by a subject area advisor.

I. ED CI 356 and 357

Minor

(i) German 200 or 201
(ii) German 330
(iii) German 350

MODERN LANGUAGES — UKRAINIAN

Major

(i) Ukrainian 200
(ii) Ukrainian 361 and 362
(iii) Slavics 301 and one of: Ukrainian 453, 454; Slavics 405
(iv) Two of: Ukrainian 411, 412, 422, 423
(v) and (vi) 12 credits in senior courses approved by a subject area advisor.

I. ED CI 356 and 357

NOTE A: Students who wish to follow Ukrainian, but who do not have Ukrainian 30 should consult with the Department of Slavic Languages for an alternative program.

NOTE B: A program in a language not mentioned elsewhere in this section may be planned in consultation with the Department of Secondary Education.

Minor

(i) Ukrainian 200
(ii) Ukrainian 361 and 362
(iii) 6 credits chosen from Ukrainian 411, 412, 422, 423

MUSIC

Major

(i) Music 250 and 251
(ii) Music 224
(iii) Music 311
(iv) Music 330 and 331
(v) Any two of Music 202, 203, 301, 304, 402
(vi) Music 415 and Music 416, 417 or Music 431 plus 3 credits from Philosophy 349, 350, 351, Music 222, 324 or other Music courses approved by the faculty advisor

II. ED CI 387 / 388

NOTE A: Music minors who have had Music 250 / 251 waived should see a Secondary Education advisor regarding substitute courses.

NOTE B: The courses outlined above provide basic specialization in the various areas of music education. Those students who wish instrumental music emphasis in their program beyond that provided in Music 311, may discuss the possibility of including, during the first years of their program, the following courses in the various instruments of the orchestra: Music 209, 216, 218, 220, 310, 317, and 319. Students who hold credit in these courses will not take Music 311. (Only two of these courses will apply as (iii), replacing Music 311; the remainder will have to be chosen as options.)

NOTE C: First year students will take Music 250 / 251 and Music 224. Entry to Music 250 / 251 normally depends on demonstrated theoretical competence while entry to Music 224 normally depends on the successful passing of an audition during May, June, and August preceding the student's first year. Under certain circumstances the first year requirements may be waived or postponed till second year.

NOTE D: Students wishing greater specialization in secondary music education than what is provided for by the above program should consult with the faculty advisor in the Department of Secondary Education.

Minor

I. (i) Music 250 and 251
(iii) Music 311
(iv) Music 330 and 331

PHYSICAL EDUCATION

Major

I. (i) Movement Education 244 and 245
(ii) Movement Education 301 and 325
(iii) (iv) and (v) 18 credits selected from the activities listed below so that there is a minimum of 3 credits from each grouping:
(a) Physical Education 224, 225, 227, 228, Movement Education 351
(b) Physical Education 211, 212, 213, 214, 215, 216, Movement Education 321
(c) Dance 270, 375, 376, Movement Education 327
(vi) Physical Education 250 and Health Education 391

II. ED CI 394 and 395

Minor

I. (i) Movement Education 244 and 245
(ii) 9 credits selected from activities listed below so that there is a minimum of 3 credits from each grouping:
(a) Physical Education 224, 225, 227, 228, Movement Education 351
(b) Physical Education 211, 212, 213, 214, 215, 216, Movement Education 321
(c) Dance 270, 375, 376, Movement Education 327
(iii) ED CI 494

PHYSICAL SCIENCES

Major

I. (i) Chemistry 202
(ii) Physics 212 or 240 or Physics 205 and Physics 207 or 209
(iii) Chemistry 350
(iv) 6 credits from Physics 301, 303, 401, 403
(v) 6 credits from senior Chemistry or senior Physics
(vi) 6 credits, approved by subject area advisor, from: Astronomy, Geology, senior Physics, senior Chemistry, or any other physical science

II. ED CI 374 and 375

NOTE A: Students without Physics 30: do Physics 203 and 209 (may also do Physics 207 in addition to or in place of Physics 209.

NOTE B: Corequisite for (i) and (ii): do Mathematics 202 / 204 as non-education option or math minor.

Minor

I. (i) Chemistry 202
(ii) Physics 212 or 6 credits chosen from Physics 203, 207, 209.
(iii) 3 credits of senior Physics or senior Chemistry
(iv) One of ED CI 469, 473, 474, 475

SOCIAL STUDIES

Major

I. (i) History 200 or 201
(ii) History 278 and 279
(iii) Geography 250 and 251
(iv) 6 credits in Geography or Anthropology
(v) and (vi) 12 credits from the social science area. These include: History, Geography, Anthropology, Sociology, Political Science, Economics, Psychology, Religious Studies, Philosophy.

II. ED CI 360 and 361

NOTE A: Students must select at least six credits from (iv), (v), or (vi) which have a Canadian Studies emphasis. The following courses satisfy the Canadian Studies requirement: Anthropology 350, 355; Economics 316/317, 318/319; Geography 360, 382; History 370, 371/372, 373, 374/375, 376, 377; Political Science 201/202, 320, 321, 326, 391, 392; Sociology 322, 323, 351, 363, 368, 377. Check the Faculty of Arts calendar for senior level courses with Canadian Studies emphasis.

NOTE B: Social Studies majors are encouraged to select at least one optional course reflecting a concern with logic of inquiry, research methodology, or philosophy of social science. For example, Philosophy 322, 353, 365; Sociology 311, 437; Political Science 317; Educational Foundations 453.

Minor

Eighteen credits chosen from the following:

I. (i) History 200 or History 201
(ii) History 278 and 279
(iii) Geography 250 and Geography 251
(iv) ED CI 462 and / or ED CI 463

73.3.3 PROGRAM IN INTERCULTURAL EDUCATION

See § 73.2.3 above.

73.4 Industrial Arts Route

73.4.1 GENERAL

Industrial arts, in its modern sense, is a subject of general education designed to reinforce and synthesize other academic disciplines, through study of materials, technologies and occupational opportunities founded on those disciplines.

A large part of the program is conducted in multiple-activity laboratories where students use up-to-date equipment and study technological influences on human resource development. The program includes all of the basic elements of professional teacher education with special attention to developing technical competencies, methods of teaching, natural and social sciences.

73.4.2 PROGRAM

Normally, the 4 year program will be as follows:

Year 1

Term I
EDFDN 201
Science
EDPSY 263
English
Social Science

Term II
Minor
Science
Social Science
English
ED PR 251

Year 2

Term I
EDIND 211
EDIND 213
EDPSY 371
Minor
EDIND 235

Term II
EDIND 233
EDFDN XXX
EDIND 237
EDIND 391
ED PR 351

Year 3

Term I
EDIND 395
EDIND 457
EDIND 4XX
EDIND 4XX
Minor

Term II
EDIND 4XX
EDADM 401
EDIND 4XX
Minor
EDPSY (Special Education)

Year 4

Term I
EDIND 485
EDIND 497
ED PR 357
ED PR 358
ED PR 359

Term II
Senior Elective
EDIND 4XX
Option
Option
Option

Note: Students transferring from other institutions may experience scheduling difficulties and should contact the Department of Industrial and Vocational Education as early as possible for individual programming.

73.4.3 PROGRAM IN INTERCULTURAL EDUCATION

See § 73.2.3 above.

73.5 Vocational Education Route

73.5.1 GENERAL

The Vocational Education Route provides preparation to teach, with specialization in teaching job entry skills in designated trade, business and technical areas at the senior high school level. These subject areas include Commercial Art, Graphic Arts, Drafting, Aircraft Maintenance, Automotives, Autobody, Building Construction, Machine Shop, Piping, Sheet Metal, Welding, Electricity, Electronics, Beauty Culture, Fashion and Furnishings, Food Preparation, Health Services, Performing Arts, Television Crafts, Horticulture, Business-Secretarial, Business-Accounting, Business-Data Processing.

Normal Faculty of Education (see Faculty of Education Calendar, § 72.1.1) admission requirements are:

(a) senior matriculation (10 credits of Vocational Education 30-level courses may be used in meeting matriculation quirements), or
(b) successful completion of one full year or more at a recognized Alberta post-secondary institution, or
(c) non-matriculated adult status.

In addition, vocational education applicants must meet special entrance requirements. Normally, evidence of competency must be presented in one of the previously mentioned subject areas through documentation of at least a four year training period and appropriate Journeyman's Certificate or equivalent.

The exception to the normal requirements is in the case of the Combined Schedule, where students may be admitted with an incomplete training period. Here the minimum is 35 high school credits in the area, or successful completion of a one year approved post-secondary training program, or successful completion (with letters of recommendation) of one year of an approved formal industrial/business based training program, in the subject areas outlined above.

Equivalency is determined by relevant documents, letters of reference and, in the case of Business applicants, a documented typing speed of not less than 55 words per minute on a 5 minute typing test with not more than 8 errors.

73.5.2 PROGRAM

The Vocational Education route is described below.

Education Courses	*Credits*
EDPSY 263	3
EDPSY 371 (263, —)	3
EDFDN 301	3
EDFDN —	3
EDADM 401	3
ED AV 361/363/470	3
EDIND 245	3
EDIND 390 (245, 263, and 371)	3
EDIND 396 (245, 251, and 371)	3
EDIND 485 (390, —)	3
EDIND 497 (390, —)	3
ED PR 251	3
ED PR 351 (—, 396)	3
ED PR 357	3
ED PR 358 (351, —)	3
ED PR 359	3
Senior Elective	3
Subject Area Courses	*Credits*
EDIND 223 (Ind. Pract.)	2
EDIND 243 (Ind. Pract.)	2
EDIND 323 (Ind. Pract.)	2
EDIND 343 (Ind. Pract.)	4
EDIND 423 (Ind. Pract.)	4
EDIND 443 (Ind. Pract.)	1
Non-Education	15
Non-Education Courses	
English	6
Minor	12
Student Selections	9
Free Options	
Open	12
Total Credits	120

NOTES:

Courses shown in brackets identify prerequisites before the comma, and either pre or co-requisites after the comma.

Subject Area: A minimum of 15 credits and a maximum of 30 credits (one year) of advanced standing is available on the program in recognition of training and experience in the identified industrial or business area.

Training. Successful completion of a four-year equivalent training period including appropriate certification is a required and integral part of the program.

(a) Normally, students will present documentation of training and Alberta certification and be awarded advanced standing in the Industrial Practicum courses, EDIND 223-443.

(b) Students admitted with an incomplete training period will receive credit toward the Industrial Practicum requirements according to the amount of training documented on entry. Students are required to register in the remaining work experience courses and carry out the requirements specified to receive further credit.

Experience. On entry into the program, students presenting work experience beyond the four-year training period receive additional standing on the basis of 3 credits for each full year of experience, up to a maximum of 15 credits.

3. "Minor" courses must be selected from one subject area other than vocational education as specified in § 73.3.2 of the Education Calendar.

4. "Non-Education" courses must be taken outside the Faculty of Education and may be used to extend competency in the minor or for a more general education.

5. "Option" courses may be selected freely and used in the area of minor, special-education courses, such as EDPSY 341 (exceptional children), or for general interest.

73.5.3 REGULAR SCHEDULE

The following is a recommended schedule of the requirements of the Vocational Education program for students entering with a Journeyman's Certificate, plus work experience.

First Year
EDIND 223
EDIND 243
EDIND 323
EDIND 343
EDIND 423
EDIND 443
Specialization
Specialization
Non-Education
Non-Education
Non-Education

Second Year
EDPSY 263
EDIND 245
ED PR 251
English
Minor

English
Minor
EDPSY 371 (263, —)
EDIND 390 (245 and 263, 371)
EDFDN 301

Third Year
EDADM 401
ED AV 361/363/470
ED PR 351 (—, 396)
EDIND 396 (245, 251 and 371)
Non-Education

Professional Term
EDIND 485 (390, —)
EDIND 497 (390, —)
ED PR 357
ED PR 358 (351, —)
ED PR 359

Fourth Year (Beyond Certification)
EDFDN —
Minor
Senior Elective

Minor
Non-Education
Non-Education
Option
Option
Option
Option

73.5.4 TRANSFER SCHEDULE

When planning to transfer from another Alberta university or college it is strongly advised that the student undertakes the equivalent of ED PR 251, EDFDN 201, EDPSY 263 and English in their originating institution and plan on attending the special summer session section of EDIND 245 before commencing the regular September term. Guidance regarding the selection of courses is advised prior to commencing an expected transfer year, as the detail depends heavily on the amount of advanced standing for business and industrial training and experience.

73.5.5 COMPRESSED SCHEDULE

Following is a recommended schedule for those qualifying and wishing to meet certification in 13 months.

Summer Session:
(Term II) — EDIND 245 and EDPSY 263

Winter Session:
ED PR 251
EDPSY 371
One of: ED AV 361/363 or 470
EDIND 396
EDIND 390
ED PR 351
EDIND 485
EDIND 497
ED PR 357
ED PR 358
ED PR 359
EDFDN 301

Spring Session:
(term I) — English (3 credits) and Non-Education (3 credits).
(Term II) — English (3 credits).

Summer Session:
(Term I) — EDADM 401 (3 credits) and Minor (3 credits).
(Term II) — Minor (3 credits).

73.5.6 COMBINED SCHEDULE

First Year:
EDIND 245
EDPSY 263
English
English
Specialization
Specialization
Non-Education
Non-Education
Non-Education
Option

Second Year:
ED PR 251
EDFDN 201
EDPSY 371 (263, —)
Minor
Minor
Minor
Minor
Non-Education
Option
Option
Spring and Summer:
(EDIND 223 — 17 weeks)
(EDIND 243 — 17 weeks)

Third and Fourth Years:
EDFDN (senior) (201, —)
ED AV 361 or 363 or 470
Non-Education
Non-Education
Option
(EDIND 323, 343 and 423)
(total of 84 weeks)

Fifth Year:
EDIND 390 (245, 371)
EDIND 396 (245, 251 and 371)
Senior Elective
ED PR 351 (—, 396)
EDADM 401

Professional Term:
EDIND 485 (390, —)
EDIND 497 (390, —)
ED PR 357
ED PR 358 (351, —)
ED PR 359
Spring:
(EDIND 443 — 8 weeks)

Applications to this program are to be submitted in the normal fashion. In addition, prospective students are strongly encouraged to contact the Department of Industrial and Vocational Education directly for specific entrance and program advice.

73.6 Post Secondary/Adult Education

This route is currently under review. Information may be obtained from the Office of the Associate Dean (Student Services).

73.7 Program for Certificated Teachers

Certificated teachers are granted credit for the first year of the general B.Ed. program for their Normal School or Junior E training, provided this training was of not less than seven months duration.

Teachers who have not attended the University of Alberta should seek admission by contacting the Registrar's Office, University of Alberta, to obtain Application of Admission forms.

Teachers who completed a one-year program offered by the University of Alberta (prior to 1962) should contact the Registrar's Office to obtain Application for Re-enrolment forms.

Program counselling will be available at specified times during the year.

73.8 Programs for Holders of Approved Degrees

73.8.1 GENERAL

The Faculty of Education offers a program to prepare holders of approved degrees for the Professional Teaching Certificate issued by the Alberta Department of Education.

Candidates will register as B.Ed./A.D. students.

73.8.2 ADMISSION

Admission to the B.Ed./A.D. program will be on the basis of:

(1) an approved degree which includes adequate preparation in an area of teaching concentration relevant to elementary and/or secondary schools;

(2) an interview for educational and professional planning. Candidates should consult with the Assistant Dean (Admissions) well in advance of a planned admission date. In cases where the degree does not have adequate prerequisites for admission, it may be necessary to complete additional courses prior to admission.

Elementary

After/Degree applicants must present 36 credits of work in areas relevant to subjects taught in elementary schools. Fifteen of these credits must be distributed over the Non-Education component of the generalist program. These 15 credits are to consist of 3 credits in each of 5 of the 7 required Elementary Elements (Canadian Studies, Fine Arts, Language and Literature, Mathematics, Natural Science, Physical Education, Social Science). Three regular terms including 13 weeks of practicum, are required to complete certification.

Secondary

Candidates seeking admission to the B.Ed. A/D, secondary route, are required to present five approved full course equivalents (30 credits) in one of the specialization areas described below (major). As well, candidates should attempt to have a second area of specialization designated as a minor (18 credits. See 73.3.2 listing for details of minor).

In each major area of specialization, specific courses are required and these or their equivalents form part of the prerequisite.

Art: Art 231; Art History 201/202 or Art History 306/356.

Biological Sciences: Chemistry 250 or 350; Biology 296, 297, 298, 299 or equivalent.

Business Education: Accounting 202, Legal Relations 310, Economics 201 and 202, Organization Theory 303 and 305, Typewriting 20.

Drama: Drama 251; Drama 243 or 245; 24 credits chosen from the following: Drama 200, 253, 273, 275, 300, 303, 321, 323, 341, 353, 357, 359, 383, 385, 403, 425.

English: English 200 or equivalent.

General Science: 6 credits from each of the following three areas: (a) Biology 296, 297, 298, 299; (b) Chemistry 100 or 200 or 202; (c) Physics 203 or 205 and Physics 207 or 209.

Home Economics: Clothing and Textiles 203; Family 350 or Sociology 371; Foods nd Nutrition 320 or 321; 325 or 326, 327 or 328. An additional 15 credits chosen from: Clothing and Textiles 200, 306, 300 or 412, 309; Family 343 or 347, 346 or 551, 440; Foods and Nutrition 320 or 321.

Mathematics: Statistics 241, Mathematics 375 or equivalent.

Modern Languages: Students who intend to enrol in the B.Ed. A/D program should present a program which resembles as much as possible the program laid out for undergraduate students in modern languages contained in § 73.3.2 of the calendar. It is appreciated that owing to a variety of factors it may be impossble to present the specific courses mentioned. Fluency in the language, good pronounciation, and a thorough grasp of the grammar of the language are the main criteria which will be considered. An understanding of the culture represented by the language is essential.

Music: Music 311, Music 330 and 331.

Physical Education: 12 credits to be chosen from the activities listed below so that there is a minimum of 3 credits from each of the groupings:
(a) Physical Education 224, 225, 227, 228, 229, Movement Education 351.
(b) Physical Education 211, 212, 213, 214, 215, 216, Movement Education 321.
(c) Dance 270, 375, 376, 475, Movement Education 327.

Physical Sciences: Chemistry 202 or equivalent; Physics 212 or equivalent; 6 credits in a senior Chemistry or Physics.

Social Studies: 6 credits in each of the following areas: (a) Canadian history; (b) European history; (c) Cultural geography.

Industrial Arts

Candidates seeking admission to the B.Ed. A/D, industrial arts route, must normally present a degree in engineering or specialized areas in science. Consultation with the Department of Industrial and Vocational Education is mandatory prior to application.

Vocational Education

Applicants must possess a recognized degree (including 6 credits in English) in addition to the previously identified vocational entrance requirements (see § 73.5.1).

73.8.3 PROGRAMS

Elementary Education

Students entering in January will follow the program outlined below:

ED CI 215 or 225 (9 credits)
EDFDN 301 (3 credits)
EDPSY 363 (3 credits)
September-April: (Professional Year)
ED CI 315 or 325 (9 credits)
EDADM 401 (3 credits)
One of: EDFDN 340, 341, 350, 360, 361 (3 credits)
EDPSY 371 (3 credits)
ED PR 210 (4 credits)
ED PR 331 (8 credits)
Professional Certificate at this point.

Students entering in September will follow the program outlined below:

Professional Year
ED CI 215 or 225 (9 credits)
EDADM 401 (3 credits)
One of: EDFDN 340, 341, 350, 360, 361 (3 credits)
EDPSY 363 (3 credits)
ED PR 210 (4 credits)
ED PR 331 (8 credits)
September-December:
ED CI 315 or 325 (9 credits)
EDFDN 301 (3 credits)
EDPSY 371 (3 credits)
Professional Certificate at this point.

To qualify for the B.Ed. degree an additional 18 credits as follows will be required:

Elective Package (12 credits)
Senior Education Elective (3 credits)
Senior Elementary Curriculum and Instruction (3 credits)

Secondary Education

The B.Ed. A/D program requires a minimum of 45 credits for certification. The following components are necessary to qualify for the Professional Certificate:

Basic Education

Educational Psychology 363/371	6 credits
Educational Foundations 301/3XX	6 credits

Educational Administration 401 3 credits

Practica*
ED PR 251 (Phase I) 3 credits
ED PR 353 (Phase II) 3 credits
ED PR 354, 355, 356 (Phase III) 9 credits

Curriculum and Instruction
ED CI 352 3 credits
ED CI (Major area) 3 credits
ED CI (Major area) 3 credits

Senior Elective 3 credits
Senior Education Option or
ED CI (Minor) 3 credits

*Note: Students enrolled in Practicum course may have the following changes in their programs:

(a) final examinations in concurrent lecture courses may be scheduled outside of designated examination weeks.
(b) students may be required to student teach during designated examination weeks.
(c) Reading Week (Term II) may be moved to coincide with school systems' Spring Break.

Professional Certificate at this point.

To complete the B.Ed. degree the following would be required:

Approved Options 15 credits

Vocational Education

Term I
ED PR 251
EDIND 245
EDFDN 301
EDPSY 363
ED AV 361 or 363 or 470

Term II
EDIND 396 (245, 251, 363)
EDIND 390 (245, 363)
EDFDN —
EDADM 401
ED PR 351
EDPSY 371

Term III
EDIND 485
EDIND 497
ED PR 357
ED PR 358
ED PR 359

Professional Certificate at this point.

To qualify for the B.Ed. degree an additional 12 credits will be required as follows:
Option
Option

Industrial Arts

Consultation with the Department of Industrial and Vocational Education is mandatory to ensure completion of the necessary content courses.

73.9 *Advanced Study in Education*

73.9.1 B.ED. FOR HOLDERS OF APPROVED DEGREES WHO ALSO HOLD THE ALBERTA PROFESSIONAL CERTIFICATE

(1) Holders of approved degrees who have not completed the Professional Diploma of The University of Alberta will be required to complete a minimum of ten full course equivalents (60 credits) in order to qualify for the B.Ed. degree.

(2) Holders of approved degrees who hold the Professional Diploma of the Faculty of Education and the Alberta Professional Certificate may qualify for the B.Ed. degree by completing a five full-course equivalent (30 credits) program planned in one of the six departments of the Faculty of Education.

73.9.2 GRADUATE DIPLOMA

The Faculty of Education offers, through its six departments, a series of graduate diploma programs providing additional special qualifications in designated areas. Normally admission to a graduate diploma program will include an undergraduate degree and a professional teaching certificate. Where exceptional circumstances warrant, one or both of the above requirements may be waived. Additional requirements may be set and quotas may be imposed on particular graduate diploma programs. Students who now hold the M.Ed. degree may not obtain the Diploma on the basis of courses credited on the M.Ed. degree program. Courses credited toward the diploma may not also be credited toward the B.Ed. degree. The pass mark for courses to be credited toward the Diploma is a grade of 5. Residence requirements for the Diploma may be met in consecutive Spring or Summer Sessions or in a Winter Session.

A candidate who does not hold a Professional Teaching Certificate will not receive one upon the completion of a Graduate Diploma. A student wishing to obtain certification must take the basic Certification program described in § 73.8.

Graduate Diploma in Post Secondary Education. A Graduate Diploma in Post-Secondary Education is available to holders of an approved degree, who have experience or a career interest at the postsecondary level. Teaching certification is not an admission requirement. Prospective students interested in some aspect of adult or higher education, should communicate directly with the Coordinator of the Centre.

Graduate Diploma for Teachers of Hearing Impaired Children. This diploma is designed for certified teachers and others who wish to teach or work in a specialist setting with hearing impaired children. It may be completed in fourteen months, and can be individually designed to meet a variety of academic and practical backgrounds from within or outside the Province of Alberta. It focuses on practical skills applicable in a variety of remedial settings. Additional information may be obtained from the Department of Educational Psychology.

73.9.3 GRADUATE DEGREE PROGRAMS

In the Faculty of Education graduate work is offered for the preparation of teachers, supervisors, guidance workers, administrators and other educational specialists, and may lead to the degrees of Master of Education, Doctor of Education and Doctor of Philosophy. Candidates for these advanced degrees choose an area of concentration corresponding to the specialization of a particular department as follows:

Department of Educational Administration: school administration (elementary and secondary), general supervision, school finance and business administration, chief administrative roles. Chairman — Dr. J. E. Seger.

Department of Educational Foundations: philosophy, sociology, and history of education, anthropology and intercultural education, comparative and international education. Chairman — Dr. P. J. Miller.

Department of Educational Psychology: counselling psychology, educational psychology, school psychology, special education. Chairman — Dr. H. W. Zingle.

Department of Elementary Education: curriculum and instruction in kindergarten, primary, and elementary education (Grades I-VI). Chairman — Dr. P. A. McFetridge.

Department of Industrial and Vocational Education: Industrial Arts and Vocational Education. Chairman — Dr. H. D. Tichenor.

Department of Secondary Education: curriculum and instruction in secondary education. (Grades VII-XII). Chairman — Dr. T. Aoki

In order to meet the needs and interests of candidates, the departments permit considerable flexibility in the programs leading to advanced degrees. In general, students pattern their courses from the offerings of the department of their choice supplemented by approved courses from other departments of the University. Normally a candidate for the master's degree must present a program consisting of six courses and a minor thesis. A candidate for the master's degree is required to spend at least one academic year in study and research in residence at The University of Alberta. A candidate for the doctor's degree (if he/she already holds a Master's degree) is normally required to spend two academic years in study and research in residence at The University of Alberta.

Graduate courses in education are offered in the Winter, Spring and Summer Sessions.

A student who wishes to inquire about graduate programs should address his/her preliminary inquiries to the Dean of the Faculty of Graduate Studies and Research, The University of Alberta, Edmonton.

After a student has decided upon an area of specialization, he/she should communicate directly with the appropriate department chairman and, if possible, arrange for an interview. By this means the student's eligibility will be determined and further information given about the degree programs available in the department.

All candidates for graduate degrees register with the Faculty of Graduate Studies and Research which administers graduate programs throughout the University.

73.9.4 SPECIAL STUDENTS

A student holding a B.Ed. degree or the equivalent and not desiring to register for a graduate degree, or not meeting all the requirements for admission to the Faculty of Graduate Studies and Research, may register in the Faculty of Education as a special student.

74 DETAILS OF COURSES

74.1 General Information

The courses listed in § § 74.2 to 74.10 inclusive represent the total offerings of the Faculty of Education. Courses on the specializations are usually offered by the Faculties of Agriculture and Forestry, Arts, Engineering, Science, Physical Education and Recreation, Business Administration and Commerce, Home Economics and Library Science. For the convenience of first year students the first course on each specialization is listed alphabetically in § 74.12.

Each course is designated by its computer abbreviation and by a number which indicates the level at which it is offered. Students should use this abbreviation and number when filling in their registration forms. Courses numbered at the 100 level are introductory, usually equivalent to senior matriculation courses; those numbered at the 200 level are junior, normally taken by first year students; those numbered at the 300 level are senior, taken after the first year; those numbered at the 400 level are advanced, normally taken by third- and fourth-year students. Courses numbered at the 500 and 600 level are open only to graduate students. In special cases students on B.Ed. programs may be permitted to register in 500 level courses but special permission to do so must be obtained in writing from the Chairman of the Department offering the course.

The course title is followed by the symbol "★" and a number indicating the course weighting used in computing the grade-point average. Usually a single-term course carries a weight of 3, a full course a weight of 6. The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. For the single-term courses the term in which the course is offered is listed first. For full courses the time allotment is normally the same in both terms.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN EITHER OR BOTH TERMS OF THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

74.2 Education — Administration

EDADM 301. *Issues in Planning and Management in Schools.* ★3 (either term, 3-0-0). Prerequisite or corequisite: EDADM 401 or consent of the Department.

EDADM 401. *The Role of the Teacher.* ★3 (either term, 3-0-0). Note: Formerly EDADM 261/461.

EDADM 463. *The Role of the Administrator and the Supervisor.* ★3 (either term, 3-0-0). Open to senior undergraduate or graduate students in Education.

EDADM 465. *Organization and Administration of Instruction in the School.* ★3 (either term, 3-0-0). Open to senior undergraduate or graduate students in Education.

EDADM 466. *Organization and Administration of Instruction in the Elementary School.* ★3 (either term, 3-0-0). Restricted to Plan B students.

Graduate Courses

EDADM 501. *Evolving Concepts in Educational Administration.* ★3 (either term, 3-0-0) Note: Formerly EDADM 561.

EDADM 502. *Administrative Processes in Education.* ★3 (either term, 3-0-0).

EDADM 505. *Selected Topics in Educational Administration I.* ★3 (either term, 3-0-0).

EDADM 506. *Selected Topics in Educational Administration II.* ★3 (either term, 3-0-0).

EDADM 511. *Research Design and Data Analysis I.* ★3 (First Term, 3-0-1).

EDADM 512. *Research Design and Data Analysis II.* ★3 (Second Term, 3-0-1).

EDADM 513. *Administration of Research and Development Projects I.* ★3 (First Term, 3-0-0).

EDADM 514. *Administration of Research and Development Projects II.* ★3 (Second Term, 3-0-0).

EDADM 515. *Research Projects I.* ★3 (either term, 3-0-2). Prerequisite: Consent of the Department. Note: Formerly EDADM 506.

EDADM 516. *Research Projects II.* ★3 (either term, 3-0-2). Prerequisite: Consent of the Department. Note: Formerly EDADM 507.

EDADM 517. *Developmental Projects I.* ★3 (either term, 3-0-0).

EDADM 518. *Developmental Projects II.* ★3 (either term, 3-0-0).

EDADM 521. *Supervision of Educational Personnel.* ★3 (either term, 3-0-0). Note: Formerly EDADM 525.

EDADM 522. *Selected Topics in Educational Supervision.* ★3 (either term, 3-0-0).

EDADM 527. *Orientations to Administrator-Student Relationships.* ★3 (either term, 3-0-0).

EDADM 528. *Administration of Student Personnel Services.* ★3 (either term, 3-0-0).

EDADM 531. *Organization of Schools.* ★3 (either term, 3-0-0).

EDADM 532. *Organization of School Districts.* ★3 (either term, 3-0-0).

EDADM 541. *Planned Change in Educational Organizations.* ★3 (either term, 3-0-0).

EDADM 542. *Adaptative Processes in Educational Organizations.* ★3 (either term, 3-0-0). Note: Formerly EDADM 563.

EDADM 545. *Educational Planning Technologies.* ★3 (either term, 3-0-0).

EDADM 546. *Educational Planning Processes.* ★3 (either term, 3-0-0).

EDADM 547. *Models for Decision Making.* ★3 (either term, 3-0-0) Note: Formerly EDADM 569.

EDADM 548. *Management of Information Systems.* ★3 (either term, 3-0-0).

EDADM 551. *Administration of Public Education in Canada.* ★3 (either term, 3-0-0). Note: Formerly EDADM 559.

EDADM 552. *Topics in Administration of Education in Canada.* ★3 (either term, 3-0-0).

EDADM 553. *Legal Aspects of Educational Administration.* ★3 (either term, 3-0-0).

EDADM 555. *Administration of Education in Selected Countries.* ★3 (either term, 3-0-0).

EDADM 557. *Administration of Intercultural Education.* ★3 (either term, 3-0-0). Note: Formerly EDADM 535.

EDADM 565. *Educational Finance.* ★3 (either term, 3-0-0).

EDADM 566. *Operational Finance.* ★3 (either term, 3-0-0).

EDADM 571. *The Organization of Post-Secondary Education.* ★3 (either term, 3-0-0).

EDADM 572. *Administration of Post-Secondary Education.* ★3 (either term, 3-0-0). Prerequisite: EDADM 571.

EDADM 591. *Supervised Individual Study I.* ★3 (either term, 3-0-0).

EDADM 592. *Supervised Individual Study II.* ★3 (either term, 3-0-0).

EDADM 593. *Seminar and Practicum in Administrative Behavior I.* ★3 (either term, 3-0-1). Prerequisite: Consent of the Department.

EDADM 594. *Seminar and Practicum in Administrative Behavior II.* ★3 (either term, 3-0-1). Prerequisite: Consent of the Department.

EDADM 605. *Problems in Educational Administration I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 663.

EDADM 606. *Problems in Educational Administration II.* ★3 (Second Term, 3-0-0) Note: Formerly EDADM 664.

EDADM 611. *Advanced Research Design and Data Analysis I.* ★3 (First Term, 3-0-0).

EDADM 612. *Advanced Research Design and Data Analysis II.* ★3 (Second Term, 3-0-0).

EDADM 625. *Administrative Behavior I.* ★3 (First Term, 3-0-0).

EDADM 626. *Administrative Behavior II.* ★3 (Second Term, 3-0-0).

EDADM 635. *Organization Theory I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 661.

EDADM 636. *Organization Theory II.* ★3 (Second Term, 3-0-0). Note: Formerly EDADM 662.

EDADM 645. *Policy Development in Education I.* ★3 (First Term, 3-0-0) Note: Formerly EDADM 667.

EDADM 646. *Policy Development in Education II.* ★3 (Second Term, 3-0-0) Note: Formerly EDADM 668.

EDADM 655. *Politics of Education I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 659.

EDADM 656. *Politics of Education II.* ★3 (Second Term, 3-0-0) Note: Formerly EDADM 660.

EDADM 665. *Economic Environment of Education I.* ★3 (First Term, 3-0-0).

EDADM 666. *Economic Environment of Education II.* ★3 (Second Term, 3-0-0).

EDADM 671. *Problems in Administration of Post-Secondary Education I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

EDADM 672. *Problems in Administration of Post-Secondary Education II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department.

EDADM 691. *Supervised Individual Study I.* ★3 (either term, 3-0-0).

EDADM 692. *Supervised Individual Study II.* ★3 (either term, 3-0-0).

EDADM 900. *Non-Thesis Project.* ★3 (either term, variable). Comprehensive problems in Educational Administration activities. Includes preparation of a final report.

EDADM 901. *Non-Thesis Project.* ★6 (variable) Comprehensive problems in Educational Administration activities. Includes preparation of a final report.

74.3 Education — Adult

EDADU 439. *Methods and Programs in the Teaching of English as a Second Language to Adults.* ★3 (either term, 3-0-0). Co-ordinated by the Department of Elementary Education.

EDADU 457. *Teaching a Second Language to Adults.* ★3 (either term, 0-3L-0). Coordinated by the Department of Secondary Education.

EDADU 460. *Conference Course in ED CI at Post-Secondary Level I.* ★3 (either term, 3-0-0). Coordinated by the Department of Industrial and Vocational Education.

EDADU 461. *Conference Course in ED CI at Post-Secondary Level II.* ★3 (either term, 3-0-0). Prerequisite: EDADU 460. Co-ordinated by the Department of Industrial and Vocational Education.

EDADU 484. *Community Home Economics Education.* ★3 (either term, 3-0-0). Coordinated by the Department of Secondary Education.

Graduate Courses

EDADU 511. *Instructional Design in Post-secondary Education.* ★3 (either term, 3-0-0).

EDADU 521. *Psychology of Learning and Teaching at the Adult Level.* ★3 (either term, 3-0-0). A study of learning and teaching from the background of educational and developmental psychology.

EDADU 523. *Administration of Further Education.* ★3 (either term, 3-0-0). Adult Education in sociological, cultural and economic perspectives; organization and implementation of programs. Coordinated by the Department of Educational Administration.

EDADU 551. *Selected Topics in Adult Education.* ★3 (either term, 3-0-0).

EDADU 555. *Research Project in Adult Education.* ★3 (either term, 3-0-0).

EDADU 557. *Independent Study in Adult Education.* ★3 (either term, 3-0-0).

EDADU 577. *Adult Education as a Field of Study.* ★3 (either term, 3-0-0).

EDADU 579. *Programs in Adult Education: A Case Study Approach.* ★3 (either term, 3-0-0).

74.4 Education — Audiovisual

ED AV 361. *Audiovisual Communications.* ★3 (either term, 0-3L-0)

ED AV 363. *Preparation of Instructional Materials.* ★3 (either term, 3-0-1).

ED AV 465. *Principles of Graphic Communication.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 467. *Principles of Photographic Communication.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 470. *Curricular Integration of Audiovisual Materials.* ★3 (Second Term, 3-0-0) Prerequisite: ED AV 361; prerequisite or corequisite: ED AV 363 or consent of the Department.

ED AV 471. *Educational Technology and Communication.* ★3 (either term, 3-0-0).

ED AV 473. *Designing Multi-Media Instruction.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 471.

ED AV 481. *Television in Education: Production and Use.* ★3 (either term, 3-0-3). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 483. *Educational Television: Preparation of Instructional Materials for Television Use.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 481 or consent of the Department.

Graduate Courses

ED AV 559. *Intermediate Production in Instructional Media.* ★3 (either term, 3-0-3) Prerequisite: ED AV 467 or consent of the Department.

ED AV 561. *Organization and Supervision of the Audiovisual Media Program I* ★3 (either term, 3-0-0). Prerequisites: ED AV 361 and 363.

ED AV 563. *Organization and Supervision of the Audiovisual Program II.* ★3 (either term 3-0-3) Prerequisite: ED AV 561.

ED AV 571. *Developing Multi-Media Instructional Materials I.* ★3 (either term, 0-3L-0). Prerequisite or corequisite: ED AV 465, ED AV 467 or consent of the Department.

ED AV 573. *Developing Multi-Media Instructional Materials II.* ★3 (either term, 0-3L-0) Prerequisite: ED AV 571.

ED AV 580. *Graduate Seminar in Educational Media.* ★6 (3-0-0). Prerequisite: ED AV 471 and ED AV 473 or consent of the Department.

ED AV 581. *Educational Television: Direction and Script Writing.* ★3 (either term, 3-0-3). Prerequisite: ED AV 483 or consent of the Department.

ED AV 583. *Educational Television: Survey of Educational Applications.* ★3 (either term, 0-3L-0). Prerequisite or corequisite: ED AV 481 or consent of the Department.

74.5 Education — Business

EDBUS 341. *Teaching of Typewriting.* ★3 (either term, 3-0-0). Prerequisite: Typewriting 20 of high school or the equivalent. Not open to students who took EDBUS 246 prior to 1973.

EDBUS 343. *The Teaching of Shorthand.* ★3 (either term, 0-5L-0). Prerequisites: Typewriting 20 and Shorthand 20 of high school or the equivalent. Not open to students who took EDBUS 248 prior to 1973.

EDBUS 351. *Office Procedures.* ★3 (either term, 3-0-0). Office organization and services.

EDBUS 355. *Business Processing.* ★3 (either term, 0-4L-0). Commercial applications, and the teaching of data processing in the secondary school.

EDBUS 357. *Curriculum and Instruction in Automated Data Processing and Accounting.* ★3 (either term, 3-0-0). Prerequisite: ACCTG 202.

EDBUS 460. *Curriculum and Instruction in Secondary School Distributive Education I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDBUS 461. *Curriculum and Instruction in Secondary School Distributive Education II.* ★3 (either term, 3-0-0). Prerequisite: EDBUS 460.

EDBUS 481. *Curriculum Laboratory in Business Education.* ★3 (either term, 3-0-0). The development of units for individualized and group instruction. Prerequisite: student teaching experience or consent of the Department.

EDBUS 483. *Curriculum and Instruction for Work Experience Programs.* ★3 (either term, 3-0-0).

EDBUS 485. *Supervised Occupational Experience.* ★3 (either term, 100 hrs; 0-1L-0). Required of business students who do not have one year of work experience.

74.6 Education — Curriculum and Instruction

74.6.1 ELEMENTARY EDUCATION

ED CI 200. *Introduction to Elementary Education.* ★3 (either term, 2-0-4). This course is intended to orient the future teacher to the elementary school. Much of the learning on the part of the student teachers will result from observation and limited participation in selected fields and simulated situations and from small group discussions both in schools and at the University.

ED CI 205. *Curriculum and Instruction in Creative Dance K-VI.* ★3 (either term, 0-3L-0). Formerly MOV 227.

ED CI 206. *Curriculum and Instruction in Games K-VI.* ★3 (Second Term, 0-3L-0). Formerly MOV 231.

ED CI 207. *Curriculum and Instruction in Elementary School Physical Education K-VI.* ★3 (either term, 0-3L-0). Not open to students who have credit in, or who are currently enroiled in MOV 201 or MOV 202. Formerly MOV 237.

ED CI 208. *Curriculum and Instruction in Educational Gymnastics K-VI.* ★3 (Second Term, 0-3L-0). Formerly MOV 251.

ED CI 212. *Curriculum and Instruction in Elementary School Social Studies.* ★3 (either term, 0-3L-0).

ED CI 215. *Elementary School Curriculum and Instruction I.* ★9 (either term, 9-0-3). An integration of the subject areas of art, mathematics, movement and science, and a selected set of basic skills of teaching.

ED CI 216. *Curriculum and Instruction in Elementary School Mathematics.* ★3 (either term, 0-3L-0).

ED CI 220. *Curriculum and Instruction in Elementary School Science.* ★3 (either term, 0-3L-0).

ED CI 224. *Curriculum and Instruction in Elementary School Reading.* ★3 (either term, 0-3L-0).

ED CI 225. *Elementary School Curriculum and Instruction I.* ★9 (either term, 9-0-3). An integration of the subject areas of language, music, reading and social studies, and a selected set of basic skills of teaching.

ED CI 229. *Curriculum and Instruction in Elementary School Language.* ★3 (either term, 0-3L-0).

ED CI 236. *Curriculum and Instruction in Elementary School Art.* ★3 (either term, 1-0-2). Additional laboratory time may be required.

ED CI 239. *Curriculum and Instruction in Elementary School Music.* ★3 (either term, 0-3L-0).

ED CI 240. *Music Education for Recreation Teachers.* ★3 (either term, 3-0-0). Restricted to Recreation Administration students.

ED CI 300. *Analysis of Teaching.* ★3 (either term, 0-3L-0). Prerequisite: ED PR 201.

ED CI 301. *Individualizing Curriculum in the Elementary School.* ★3 (either term, 0-3L-0).

ED CI 302. *The Teacher's Role in Curriculum Development.* ★3 (either term, 3-0-0).

ED CI 304. *Orientation to Early Childhood Education.* ★3 (either term, 3-0-0). Note: this course is designed for students in Departments other than Elementary Education and for students in Elementary Education who are not specializing in Early Childhood Education.

ED CI 306. *Curriculum and Instruction in the Outdoors K-VI.* ★3 (Second Term, 3-0-0). Prerequisite: MOV 201 or MOV 202 or consent of the Department. Not open to first and second year students. Formerly MOV 389.

ED CI 308. *Introduction to Second Language Teaching in the Elementary School.* ★3 (either term, 3-0-0). Prerequisite: At least one course in the language to be taught or consent of the Department.

ED CI 309. *Introduction to the Teaching of English as a Second Language.* ★3 (either term, 3-0-0).

CU ME 310. *L'enseignement du francais aux francophones.* ★3 (l'un ou l'autre semestre, 3-0-0). Cours d'introduction a l'enseignement du francais langue maternelle au niveau de l'ecole elementaire. Note: ce cours sera donne a la Faculté Saint-Jean par ses propres instructeurs. (Voir CU ME de la Faculté).

CU ME 311. *L'enseignement du francais au deuxieme cycle l'elementaire.* ★3 (2eme semestre, 3-0-0).

ED CI 312. *The Teaching of Current Canadian Social Issues in Elementary Schools.* ★3 (either term, 3-0-0).

ED CI 315. *Elementary School Curriculum and Instruction II.* ★9 (either term, 9-0-3). An integration of the subject art, mathematics, movement and science, and a selected set of basic skills of teaching. Prerequisite: ED CI 225.

ED CI 316. *Laboratory Procedures and Materials for Elementary School Mathematics.* ★3 (First Term, 0-0-3).

ED CI 317. *Diagnostic Teaching of Mathematics.* ★3 (either term, 3-0-0) Prerequisite: ED CI 216 or equivalent.

ED CI 320. *Instruction in Elementary School Science.* ★3 (either term 0-3L-0). Prerequisite: ED CI 220 or equivalent.

ED CI 323. *Introduction to Elementary School Reading Instruction.* ★3 (either term, 0-3L-0). Senior students only. Credit granted for either ED CI 224 or ED CI 323 but not both.

ED CI 324. *Trends and Issues in the Teaching of Reading.* ★3 (either term, 3-0-1). Prerequisite: Open to senior students or by permission of instructor.

ED CI 325. *Elementary School Curriculum and Instruction II.* ★9 (either term, 9-0-3). An integration of the subject art, mathematics, movement and science, and a selected set of basic skills of teaching. Prerequisite: ED CI 215.

ED CI 326. *Diagnostic Teaching of Reading.* ★3 (either term, 3-0-1). Prerequisite: An ED CI course equivalent in reading.

ED CI 329. *Elementary School Language.* ★3 (either term, 0-3L-0). Prerequisite: ED CI 229 or equivalent.

ED CI 332. *Speech Problems: Role of the Classroom Teacher.* ★3 (either term, 3-0-0).

ED CI 333. *Seminar in Group Projects in Elementary Education I.* ★variable (either term, variable). Prerequisite: Consent of the Department.

ED CI 336. *Children's Art Laboratory.* ★3 (either term, 2-0-3). Additional laboratory time may be required.

ED CI 337. *Art Materials and Processes in the Schools.* ★3 (either term, 1-0-4).

ED CI 338. *Children's Art Expression in Contemporary Culture.* ★3 (either term, 3-0-0).

ED CI 339. *Music in the Elementary School.* ★3 (either term, 0-3L-0). An introductory course in music curriculum and instruction designed for students in the Music specialization and students with a music background, who have the consent of the Department. Not open to students who have taken ED CI 239.

ED CI 344. *Supervised Independent Study in Elementary Education I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 345. *Seminar in Group Projects in Elementary Education I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 346. *Introduction to School Libraries.* ★3 (either term, 3-0-0).

ED CI 402. *Curriculum and Instruction in the Elementary School I.* ★6 (First Term, 6-0-4).

ED CI 403. *Curriculum and Instruction in the Elementary School II.* ★6 *(Second Term, 6-0-4). Prerequisite: ED CI 402.*

ED CI 404. *Curriculum and Instruction in Early Childhood Education.* ★6 (3-0-3; 3-0-0) or (3-0-0; 3-0-3). Restricted to senior students in Early Childhood Education Specialization.

ED CI 406. *Curriculum and Instruction in Elementary School Physical Education.* ★3 (either term, 3-0-0). Prerequisite: Fourth year students who have a background of movement courses for children (MOV) or consent of the Department. Formerly MOV 437.

ED CI 408. *Methods and Programs in the Teaching of Second Languages in the Elementary School.* ★3 (either term, 3-0-0). Prerequisite: ED CI 308 or consent of the Department.

ED CI 409. *Methods and Programs in the Teaching of English as a Second Language.* ★3 (either term, 3-0-0). Prerequisite: ED CI 309 or consent of the Department.

ED CI 412. *Curriculum in Elementary School Social Studies.* ★3 (either term, 3-0-0) Prerequisite: ED CI 212 or equivalent.

ED CI 413. *Instruction in Elementary School Social Studies.* ★3 (either term, 3-0-0). Prerequisite or corequisite: ED CI 412. In addition, at least one course in social science or history or consent of the Department.

ED CI 414. *Innovations in Elementary School Social Studies Curriculum and Instruction.* ★3 (either term, 3-0-0). Note: This course is designed for practising teachers.

ED CI 416. *Instruction in Elementary School Mathematics.* ★3 (either term, 3-0-0) Prerequisite: ED CI 216 or equivalent.

ED CI 417. *Curriculum in Elementary School Mathematics.* ★3 (either term, 3-0-0). Prerequisite: ED CI 416 and at least one course in mathematics or consent of the Department.

ED CI 420. *Curriculum in Elementary School Science.* ★3 (either term, 0-3L-0). Prerequisites: ED CI 320 and at least one laboratory science course or consent of the Department.

ED CI 423. *The Reading Process: Theory and Observation.* ★3 (either term, 3-0-0). Prerequisite: ED CI 224 or 323 or written consent of the Department.

ED CI 424. *Reading in Early Childhood Education.* ★3 (either term, 0-3L-0). Prerequisite: ED CI 224 or 323.

ED CI 425. *Reading in Upper Elementary School.* ★3 (Second Term, 0-3L-0). Prerequisite: ED CI 224 or 323.

ED CI 427. *Teaching Literature in Elementary Schools.* ★3 (either term, 3-0-0).

ED CI 429. *Using Language in the Content Areas.* ★3 (either term, 0-3L-0). Prerequisite: ED CI 229 or ED CI 329 or equivalent.

ED CI 430. *Creative Aspects of Language in the Elementary School.* ★3 (either term, 0-3L-0). Prerequisite: ED CI 229 or ED CI 329 or equivalent.

ED CI 432. *Speech in the Elementary School.* ★3 (Second Term, 0-3L-0). Prerequisite: ED CI 332.

ED CI 433. *Seminar in Group Projects in Elementary Education 2.* ★variable (either term, variable). Prerequisite: Consent of the Department.

ED CI 436. *Art Education Laboratory.* ★3 (either term, 2-0-3). Prerequisite: ED CI 336.

ED CI 437. *Art Program Development in the Elementary School.* ★6 (3-0-1). Prerequisites: One half course in art education and one full course equivalent in art.

ED CI 439. *Music in the Elementary School I.* ★3 (First Term, 3-0-2). Prerequisites: ED CI 239 or ED CI 339 or equivalent and at least one course in music, or consent of the Department.

ED CI 440. *Music in the Elementary School II.* ★3 (Second Term, 3-0-2). Prerequisite: ED CI 439.

ED CI 443. *School Library Services.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346 or consent of the Department.

ED CI 444. *Supervised Independent Study in Elementary Education II.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 445. *Seminar in Group Projects in Elementary Education II.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

ED CI 446. *Selection of School Library Materials.* ★3 (either term, 3-0-0) Prerequisite or corequisite: ED CI 346 or consent of the department.

ED CI 447. *Organization of School Library Materials.* ★3 (either term, 3-0-2). Prerequisite or corequisite: ED CI 346 or consent of the department.

Graduate Courses

ED CI 500. *Research Seminar.* ★0. Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures. The seminar will be offered as arranged. No course credit will be given.

ED CI 501. *Seminar in Elementary Education.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

ED CI 502. *Research Seminar.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ED CI 503. *Early Childhood Education: Home/School/Community Relations.* ★3 (3-0-0). This course is designed to investigate the teacher's role in improving communication among the school, home, and community.

ED CI 504. *Program Development in Early Childhood.* ★3 (either term, 3-0-0) Prerequisite: ED CI 404 or consent of the Department.

ED CI 505. *Research in Program Development in Early Childhood Education.* ★3 (either term, 3-0-0). Prerequisite: ED CI 504 or consent of the Department.

ED CI 506. *Program Development in Elementary School Physical Education.* ★6 (0-3L-0). Prerequisite: Graduate students only. Formerly MOV 530.

ED CI 508. *Program Development in Second Languages at the Elementary Level.* ★6 (3-0-0). Prerequisite: ED CI 408, or 409 or consent of the Department.

ED CI 509. *Problems in the Teaching of English as a Second or Other Language.* ★3 (either term, 3-0-0) Prerequisite: ED CI 309 and 409 or equivalent.

ED CI 510. *Program Development in the Teaching of English as a Second or Other Language.* ★3 (either term, 3-0-0). Prerequisite: ED CI 309 and ED CI 409 or equivalent.

ED CI 512. *Program Development in Elementary Social Studies I.* ★3 (either term, 3-0-0). Prerequisites: ED CI 412 and ED CI 413 or consent of the Department.

ED CI 513. *Program Development in Elementary Social Studies II.* ★3 (either term, 3-0-0) Prerequisite: ED CI 512 or consent of the Department.

ED CI 516. *Program Development in Elementary School Mathematics I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 417 or consent of the Department.

ED CI 517. *Research in Mathematics Education I.* ★3 (either term, 3-0-0) Prerequisite: ED CI 417 or consent of the Department.

ED CI 520. *Research in Elementary School Science.* ★3 (either term, 3-0-0). Prerequisite: ED CI 420 or consent of the Department.

ED CI 521. *Program Development in Elementary School Science.* ★3 (either term, 3-0-0). Prerequisite: ED CI 420 or consent of the Department.

ED CI 522. *Theory of Reading Processes.* ★3 (either term, 3-0-0). Prerequisite: One-half course equivalent in Reading Education and one-half course equivalent in Language Education.

ED CI 523. *Research in Reading Processes.* ★3 (either term, 3-0-0). Prerequisite: ED CI 522 or consent of the Department.

ED CI 524. *Diagnostic Instruments in Reading.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 525. *Diagnosis of Reading Disability.* ★3 (either term, 3-0-3). Prerequisite: Consent of the Department.

ED CI 526. *Remedial Procedures for Reading Problems.* ★3 (either term, 3-0-3). Prerequisite: Consent of the Department.

ED CI 527. *The Reading Curriculum.* ★3 (either term, 3-0-0). Prerequisite or corequisite: Ed CI 522 or consent of the Department.

ED CI 528. *Organization of the Reading Program.* ★3 (Second Term, 3-0-0). Problems of organization, development, evaluation and supervision of the reading program. Prerequisite: Consent of the Department.

ED CI 529. *Language Acquisition and Growth in Young School Children.* ★3 (either term, 3-0-0) Prerequisite: ED CI 429 or 430 or equivalent.

ED CI 530. *Program Development for the Expansion of Elementary Children's Language.* ★3 (either term, 3-0-0). Prerequisite: ED CI 529.

ED CI 533. *Seminar in Group Projects in Elementary Education 3.* ★variable (either term, variable). Prerequisite: Consent of the Department.

ED CI 537. *Program Development and Research in Elementary School Art: Performance.* ★3 (either term, 3-0-0). Prerequisite: ED CI 437 or consent of the Department.

ED CI 538. *Program Development and Research in Elementary School Art: History and Criticism.* ★3 (either term, 3-0-0). Prerequisite: ED CI 437 or consent of the Department.

ED CI 539. *Program Development in Elementary School Music.* ★3 (First Term, 3-0-0) Prerequisite: ED CI 439 or consent of the Department.

ED CI 540. *Research in Elementary School Music.* ★3 (Second Term, 3-0-0) Prerequisite: ED CI 539 or consent of the Department.

ED CI 544. *Directed Individual Study in Elementary Education.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 545. *Directed Individual Study in Elementary Education.* ★6 (variable). Prerequisite: Consent of the Department.

ED CI 547. *Directed Study in School Library Programs.* ★3 (either term, 3-0-0). Prerequisite: ED CI 446 and 447 or consent of the instructor. (Listed also as LIB S 569.)

ED CI 551. *Curriculum Design.* ★3 (either term, 3-0-0). The application of curriculum theory to a specific task; the planning of a curriculum which can be used by teachers as a point of departure for their teaching.

ED CI 600. *Curriculum and Instruction Laboratory.* ★0. Discussion and supervision of experiences designed to prepare doctoral students for pre-service and in-service education of Elementary School teachers. Compulsory for all doctoral students.

ED CI 601. *Seminar in Elementary Education.* ★3 (both terms, 0-1.5s-0) or (either term, 0-3s-0). Discussion of perennial issues and current solutions to problems in elementary education. Compulsory for all doctoral students.

ED CI 602. *Conference Course in Elementary Education.* ★6 (variable).

ED CI 603. *Symposium in Elementary Education.* ★3 (both terms, 1.5-0-0) or (either term, 3-0-0). Research reports by staff and students. Compulsory for all doctoral students.

ED CI 612. *Research in Elementary School Social Studies.* ★3 (First Term, 3-0-0).

ED CI 613. *Planning Research in Elementary School Social Studies.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 612.

ED CI 616. *Program Development in Elementary School Mathematics II.* ★3 (either term, 3-0-0).

ED CI 617. *Research in Mathematics Education II.* ★3 (either term, 3-0-0).

ED CI 623. *Theories and Models of Reading Process.* ★3 (either term, 3-0-0).

ED CI 624. *Research I: Bases of Knowledge for Reading Research.* ★3 (either term, 3-0-0).

ED CI 625. *Research II: Recent Research in Reading.* ★3 (either term, 3-0-0).

ED CI 626. *Theory and Analysis of Reading Assessment.* ★3 (either term, 3-0-3). Prerequisite: ED CI 525.

ED CI 627. *Evaluation and Administration of Remedial Procedures.* ★3 (either term, 3-0-3).

ED CI 629. *Research in Language.* ★6 (3-0-0).

ED CI 637. *Research in Art Education.* ★6 (3-0-0).

ED 644. *Individual Project.* ★3 (either term, variable). Comprehensive problems in Curriculum and Instruction — Elementary. Includes preparation of final report.

ED 645. *Individual Project.* ★6 (variable). Comprehensive problems in Curriculum and Instruction — Elementary. Includes preparation of final report.

ED CI 649. *Curriculum Evaluation.* ★3 (First Term, 3-0-0). An inter-departmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3 (either term, 3-0-0). The preparation and implementation of an evaluation study in the field. Prerequisite or corequisite: ED CI 649.

ED CI 900. *Non-Thesis Project.* ★6 (variable) Non-thesis route research project. Includes preparation of final report.

ED CI 901. *Non-Thesis Project.* ★3 (either term, variable) Non-thesis route research project. Includes preparation of final report.

74.6.2 ELEMENTARY AND SECONDARY (COMMON COURSES)

ED CI 132. *Speech Improvement.* ★0.

ED CI 346. *Introduction to School Libraries.* ★3 (either term, 3-0-0).

ED CI 348. *Reading in Junior High School.* ★3 (Second Term, 0-3L-0).

ED CI 349. *Reading in Senior High School.* ★3 (Second Term, 0-3L-0).

ED CI 443. *School Library Services.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346 or consent of the Department.

ED CI 446. *Selection of School Library Materials.* ★3 (either term, 3-0-0) Prerequisite: ED CI 346.

ED CI 447. *Organization of School Library Materials.* ★3 (either term, 3-0-2). Prerequisite: ED CI 346.

ED CI 448. *The Mathematics Curriculum in the Elementary and Secondary School.* ★3 (either term, 3-0-0).

ED CI 450. *The Teacher's Role in Curriculum Development.* ★3 (either term, 3-0-0).

Graduate Courses

ED CI 547. *Directed Study in School Library Programs.* ★3 (either term, 3-0-0). Prerequisite: ED CI 446 and 447 or consent of the Department.

ED CI 549. *Curriculum Development.* ★3 (First Term, 3-0-0). Curriculum theory and research with particular reference to determinants of curriculum, curriculum development, implementation and evaluation.

ED CI 550. *Current Curriculum Developments.* ★3 (Second Term, 3-0-0). Problems and practices in innovation and evaluation of current curriculum developments.

ED CI 551. *Curriculum Design.* ★3 (Second Term, 3-0-0). The application of curriculum theory to a specific task: the planning of a curriculum which can be used by teachers as a point of departure for their teaching.

ED CI 649. *Curriculum Evaluation.* ★3 (First Term, 3-0-0). An inter-departmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3 (either term, 3-0-0). The preparation and implementation of an evaluation study in the field. Prerequisite or corequisite: ED CI 649.

74.6.3 SECONDARY EDUCATION

ED CI 296. *Driver Education.* ★3 (either term 3-0-3). Offered in Summer Session only.

ED CI 346. *Introduction to School Libraries.* ★3 (either term, 3-0-0).

ED CI 348. *Reading in Junior High School.* ★3 (Second Term 0-3L-0).

ED CI 349. *Reading in Senior High School.* ★3 (Second Term, 0-3L-0).

ED CI 352. *Teaching in the Secondary Schools.* ★3 (either term, 3-0-1).

ED CI 353. *Curriculum and Instruction in Secondary School English I.* ★3 (either term, 3-0-0).

ED CI 354. *Curriculum and Instruction in Secondary School English II.* ★3 (either term, 3-0-0).

ED CI 355. *Speech in the Secondary School.* ★3 (either term, 0-3L-0).

ED CI 356. *Curriculum and Instruction in Secondary School Second Language I.* ★3 (either term, 0-3L-0). Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 357. *Curriculum and Instruction in Secondary School Second Language II.* ★3 (either term, 0-3L-0). Prerequisites or corequisites: Three full courses in the teaching specialization and ED CI 356.

CU ME 358. *L'enseignement du francais aux francophones.* ★3 (l'un ou autre semestre, 4-0-0). Cours d'introduction a l'enseignement du francais langue maternelle aux niveaux de l'ecole secondaire inferieure et superieure. Note: ce cours sera donne a la Faculté Saint-Jean par ses propres instructeurs.

ED CI 360. *Curriculum and Instruction in Secondary School Social Studies I.* ★3 (First Term, 3-0-0). Prerequisites: Three full courses in the teaching specialization or consent of the Department.

ED CI 361. *Curriculum and Instruction in Secondary School Social Studies II.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 360 or consent of the Department.

ED CI 364. *Introduction to Mathematics Curriculum in Secondary Education.* ★3 (either term, 3-0-0).

ED CI 365. *Introduction to Methods for Teaching Mathematics in Secondary Schools.* ★3 (either term, 3-0-0).

ED CI 368. *Introduction to Teaching Secondary School General Science I.* ★3 (Second Term, 0-3L-0). Prerequisites: Three full course equivalents in the teaching specialization for continuing B.Ed. students, or five full course equivalents for students with approved degrees, or consent of the Department.

ED CI 369. *Introduction to Teaching Secondary School General Science II.* ★3 (Second Term, 0-3L-0). Prerequisites: ED CI 368 or consent of the Department.

ED CI 370. *Introduction to Teaching Secondary School Biological Science I.* ★3 (either term, 0-3L-0). Prerequisites: Three full course equivalents in the teaching specialization for continuing B.Ed. students or five full course equivalents for students with approved degrees, or consent of the Department.

ED CI 371. *Introduction to Teaching Secondary School Biological Science II.* ★3 (either term, 0-3L-0). Prerequisite: ED CI 370 or consent of the Department.

ED CI 374. *Introduction to Teaching Secondary School Physical Science I.* ★3 (Second Term, 0-3L-0). Prerequisites: Three full course equivalents in the teaching specialization for continuing B.Ed. students, or five full course equivalents for students with approved degrees, or consent of the Department.

ED CI 375. *Introduction to Teaching Secondary School Physical Science II.* ★3 (Second Term, 0-3L-0). Prerequisite: ED CI 374 or consent of the Department.

ED CI 378. *Curriculum and Instruction in Secondary School Business Education I.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 379. *Curriculum and Instruction in Secondary School Business Education II.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization and ED CI 378.

ED CI 382. *Curriculum and Instruction in Secondary School Home Economics I.* ★3 (Second Term, 3-0-1). Prerequisites or corequisites: Three full courses in the teaching specialization or consent of the Department.

ED CI 383. *Curriculum and Instruction in Secondary School Home Economics II.* ★3 (Second Term, 3-0-1). Prerequisite: ED CI 382 or consent of the Department.

ED CI 384. *Advanced Curriculum and Instruction in Secondary School Home Economics I.* ★3 (either term, 3-0-0). Prerequisites: ED CI 382 / 383 or consent of the Department.

ED CI 385. *Art Curriculum in the Secondary School.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 386. *Art Instruction in the Secondary School.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization and ED CI 385.

ED CI 387. *Curriculum and Instruction in Secondary School Music I.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 388. *Curriculum and Instruction in Secondary School Music II.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization and ED CI 387.

ED CI 389. *Curriculum and Instruction in Secondary School Drama I.* ★3 (Second Term, 3-0-0). Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 390. *Curriculum and Instruction in Secondary School Drama II.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 389.

ED CI 391. *Practicum in Secondary School Music I.* ★6 (0-6L-0).

ED CI 392. *Recent Studies in Art Curriculum and Instruction.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 393. *Advanced Curriculum and Instruction in Secondary Drama Education I.* ★3 (First Term, 3-0-0). Prerequisites or corequisites: ED CI 389 / 390 or 489 / 490.

ED CI 394. *Curriculum and Instruction in Secondary School Physical Education I.* ★3 (either term, 3-0-0). Prerequisites: MOV 244 / 245 and two full courses in the teaching specialization for continuing B.Ed. students, or five full course equivalents for students with approved degrees, or consent of the Department.

ED CI 395. *Curriculum and Instruction in Secondary School Physical Education II.* ★3 (either term, 3-0-0). Prerequisite: ED CI 394.

ED CI 443. *School Library Services.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346 or consent of the Department.

ED CI 446. *Selection of School Library Materials.* ★3 (either term, 3-0-0). Prerequisite or corequisite: ED CI 346 or consent of the Department.

ED CI 447. *Organization of School Library Materials.* ★3 (either term, 3-0-2). Prerequisite or corequisite: ED CI 346 or consent of the Department.

ED CI 448. *The Mathematics Curriculum in the Elementary and Secondary School.* ★3 (either term, 3-0-0).

ED CI 452. *Teaching Literature in the Secondary School.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 453. *Teaching Language and Composition in the Secondary School.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 454. *Curriculum and Instruction in Secondary School English.* ★6 (3-0-0).

ED CI 456. *Curriculum and Instruction in Secondary School Second Language I.* ★3 (either term, 0-3L-0).

ED CI 457. *Curriculum and Instruction in Secondary School Second Language II.* ★3 (either term, 0-3L-0).

ED CI 458. *New Approaches to Second Language Instruction.* ★3 (either term, 0-3L-0).

ED CI 459. *Advanced Curriculum and Instruction in Second Language Teaching.* ★3 (either term, 0-3L-0).

ED CI 460. *Curriculum and Instruction in Secondary School Social Studies I.* ★3 (First Term, 3-0-0).

ED CI 461. *Curriculum and Instruction in Secondary School Social Studies II.* ★3 (Second Term, 3-0-0).

ED CI 462. *Innovations in Secondary School Social Studies Curriculum.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 463. *New Approaches in Secondary School Social Studies Instruction.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 464. *An Introduction to the Teaching of Secondary School Mathematics.* ★3 (either term, 3-0-0).

ED CI 465. *An Introduction to Curriculum and Instruction in Secondary School Mathematics.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 464 or consent of the Department.

ED CI 466. *The Use of Computers in the Teaching and Learning of Mathematics.* ★3 (either term, 3-0-1). Prerequisite: ED CI 364 or consent of the Department.

ED CI 467. *Teaching Mathematics in the Junior High School.* ★3 (either term, 3-0-0).

ED CI 468. *Specialized Methods in Secondary School Mathematics Teaching.* ★3 (either term, 3-0-0).

ED CI 469. *The Junior High School Science Curriculum.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 470. *Methods and Resources for Teaching the Earth-Space Sciences.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 471. *The Senior High School Biology Curriculum.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 472. *Methods and Resources for Teaching Secondary School Biology.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 473. *The Physics and Chemistry Curriculum in the Senior High School.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 474. *Methods and Resources for Teaching Secondary School Physical Sciences.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 475. *Environmental Education for the Secondary School.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 476. *Testing and Evaluation in Science Teaching.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 478. *Curriculum and Instruction in Secondary School Business Education I.* ★3 (either term, 3-0-0).

ED CI 479. *Curriculum and Instruction in Secondary School Business Education II.* ★3 (either term, 3-0-0).

ED CI 480. *Advanced Curriculum and Instruction in Secondary Business Education I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 378 or 478 or consent of the Department.

ED CI 481. *Advanced Curriculum and Instruction in Secondary School Business Education II.* ★3 (either term, 3-0-0). Prerequisite: ED CI 480.

ED CI 482. *Curriculum and Instruction in Secondary School Home Economics I.* ★3 (either term, 3-0-0).

ED CI 483. *Curriculum and Instruction in Secondary School Home Economics II.* ★3 (either term, 3-0-0).

ED CI 484. *Advanced Curriculum and Instruction in Secondary School Home Economics II.* ★3 (either term, 3-0-0). Prerequisites: ED CI 382 / 383 or consent of the Department.

ED CI 485. *Crafts Teaching in the Secondary School.* ★3 (either term, 1-3s-0). Prerequisite: Consent of the Department.

ED CI 486. *Fine Arts Criticism in the Secondary School.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 487. *Curriculum and Instruction in Secondary School Music I.* ★3 (either term, 3-0-0).

ED CI 488. *Curriculum and Instruction in Secondary School Music II.* ★3 (either term, 3-0-0).

ED CI 489. *Curriculum and Instruction in Secondary School Drama I.* ★3 (First Term, 3-0-0).

ED CI 490. *Curriculum and Instruction in Secondary School Drama II.* ★3 (Second Term, 3-0-0).

ED CI 491. *Practicum in Secondary School Music II.* ★6 (0-6L-0). Registration limited to secondary route students on a music specialization who have completed the first year of MELAB.

ED CI 493. *Advanced Curriculum and Instruction in Secondary Drama Education II.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 393.

ED CI 494. *Curriculum and Instruction in Secondary School Physical Education I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 495. *Curriculum and Instruction in Secondary School Physical Education II* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 395 or consent of the Department.

ED CI 497. *Conference Seminar.* ★3 (either term, 3-0-0).

ED CI 498. *Conference Seminar.* ★3 (either term, 3-0-0).

ED CI 499. *Guided Individual Study in Secondary Education.* ★3 (either term, 3-0-0). Prerequisite: Consent of the instructor and the Department.

Graduate Courses

ED CI 549. *Curriculum Development.* ★3 (First Term, 3-0-0). Curriculum theory and research with particular reference to determinants of curriculum, curriculum development, implementation and evaluation.

ED CI 550. *Current Curriculum Developments.* ★3 (Second Term, 3-0-0). Problems and practices in innovation and evaluation of current curriculum developments.

ED CI 551. *Curriculum Design.* ★3 (either term, 3-0-0). The application of curriculum theory to a specific task; the planning of a curriculum which can be used by teachers as a point of departure from their teaching.

ED CI 560. *Instructional Planning in Secondary School Social Studies.* ★3 (either term, 3-0-0).

ED CI 561. *Historical Methodology in Secondary School Social Studies.* ★3 (either term, 3-0-0).

ED CI 564. *Secondary Mathematics Education Research Seminar.* ★3 (First Term, 3-0-0).

ED CI 565. *Secondary Mathematics Education Program Development.* ★3 (Second Term, 3-0-0).

ED CI 570. *Science and Society: Implications for Teaching.* ★3 (either term, 0-3s-0). A seminar course on the nature of science and social aspects of science, and implications for science teaching. Emphasis is placed on the understanding of the scientific components of current social problems, and techniques and curricula for dealing with the nature and social context of science.

ED CI 574. *Instructional Strategies in Science Teaching.* ★3 (either term, 0-3s-0). A seminar course in which an in-depth study is made of the major techniques in science instruction. Heavy emphasis is given to research in science education and its implication for instruction.

ED CI 596. *Research Methods in Secondary Education.* ★3. (First Term, 3-0-0).

ED CI 597. *Research Design in Secondary Education.* ★3. (Second Term, 3-0-0).

ED CI 598. *Conference Seminar in Secondary Education I.* ★3 (either term, 0-3s-0) Prerequisite: Consent of instructor and Department.

ED CI 599. *Advanced Level Guided Individual Study in Secondary Education 1, 2, or 3.* ★3 (variable). Prerequisite: Consent of instructor and Department.

ED CI 649. *Curriculum Evaluation.* ★3. (First Term, 3-0-0). An inter-departmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3. (either term, 3-0-0). The preparation and implementation of an evaluation study in the field. Prerequisite or corequisite: ED CI 649.

ED CI 654. *Seminar: Secondary Education English.* ★6 (0-3s-0).

ED CI 656. *Seminar: Secondary Education Second Language.* ★6 (0-3s-0).

ED CI 660. *Seminar: Secondary Education Social Studies.* ★6 (0-3s-0).

ED CI 664. *Seminar: Secondary Education Mathematics.* ★6 (0-3s-0).

ED CI 670. *Development, Implementation and Evaluation of Science Curricula.* ★3 (either term, 0-3s-0). An advanced seminar course on theory, practice and research on science curricula. The historical, philosophical, psychological and sociological aspects of science curricula are also considered, as are the applications of information storage, retrieval and dissemination techniques to curriculum materials.

ED CI 674. *Current Issues and Trends in Science Education.* ★3 (either term, 0-3s-0). A seminar course in which an examination and synthesis is made of current thinking and research in science education. Topics are selected from major areas of interest including curriculum development, scientific literacy, science concept acquisition, instruction and evaluation. Emphasis is given to classroom applications of major ideas.

ED CI 678. *Seminar: Secondary School Business Education.* ★6 (3-0-0).

ED CI 682. *Seminar: Secondary Education Home Economics.* ★6 (3-0-0).

ED CI 685. *Current Issues in Art Education.* ★3 (First Term, 3-0-0). Prerequisite: Undergraduate major in art or consent of instructor.

ED CI 686. *Directed Study in Art Education.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 685 or consent of Department.

ED CI 687. *Seminar: Secondary Education Music.* ★6 (3-0-0).

ED CI 689. *Seminar: Secondary Education Drama.* ★6 (3-0-0).

ED CI 690. *Advanced Research Topics in Secondary Education.* ★3. (either term, 3-0-0).

ED CI 694. *Seminar: Curriculum in Secondary School Physical Education.* ★3 (First Term, 3-0-0)

ED CI 695. *Seminar: Instruction in Secondary School Physical Education.* ★3 (Second Term, 3-0-0).

ED CI 696. *Secondary Education.* ★6 (3-0-0). Reading and discussion of research, curriculum, and teaching procedures in one of the major fields of the secondary school.

ED CI 697. *The Curriculum of Teacher Education.* ★6 (3-0-0). This course is designed for the achievement of a perspective on current philosophies and practices in teacher education, and the identification of proposals for modification and reform.

ED CI 698. *Conference Seminar in Secondary Education II.* ★3 (either term 0-3s-0) Prerequisite: Consent of instructor and Department.

ED CI 950. *Non-Thesis Project.* ★3 (variable). Colloquium project. Restricted to non-thesis students in Secondary Education.

74.7 Education — Foundations

EDFDN 201. *Introduction to Canadian Education.* ★3 (either term, 3-0-0). A sociological analysis of the historical development of Canadian education with particular reference to the relationship between schooling and other agencies of socialization viewed in their social, political, and economic context.

EDFDN 301. *Education in Canada: Selected Topics.* ★3 (either term, 3-0-0). Not to be taken by students who have credit in EDFDN 201.

EDFDN 340. *Schools and Their Curriculum: An Historical Study.* ★3 (either term, 3-0-0). An examination and analysis of the varieties of curriculums which have been employed in particular types of schools throughout the history of Western Civilization, with particular emphasis upon the modern period. Formerly EDFDN 381.

EDFDN 341. *Concepts of Childhood in History.* ★3 (either term, 3-0-0). A study of those views of childhood which have exerted a significant influence on educational theory and practice over the last two hundred years. Formerly EDFDN 481.

EDFDN 350. *Fundamental Problems in Education: A Philosophical Perspective.* ★3 (either term, 3-0-0).

EDFDN 360. *Society and Education.* ★3 (either term, 3-0-0). The changing function and structures of education, with special reference to contemporary Canadian society. Formerly EDFDN 413.

EDFDN 361. *Sociology of Learning and Achievement.* ★3 (either term, 3-0-0). Formerly EDFDN 421.

EDFDN 401. *Selected Topics in Educational Foundations.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 402. *Directed Study in Educational Foundations.* ★3 (either term, 3-0-0) Prerequisite: Consent of the Department. Formerly EDFDN 499.

EDFDN 410. *Cross Cultural Studies in Education.* ★3 (either term, 3-0-0). The ethnographic study of education and cultural change. Prerequisite: ANTHR 202, or ANTHR 307, or ANTHR 325, or ANTHR 350, or ANTHR 355, or consent of the Department.

INT D 416. *Anthropology and Education.* ★6 (3-0-0). Prerequisite: A basic course in anthropology or consent of the Department.

EDFDN 420. *Contemporary Systems of Education in Western Europe, the U.S.A. and the U.S.S.R.* ★3 (either term, 3-0-0). Formerly EDFDN 471.

EDFDN 422. *Education in Developing Countries: A Study of Education in Selected Areas in Asia, Africa and Latin America.* ★3 (either term, 3-0-0) Formerly EDFDN 473.

EDFDN 430. *History of Education in Western Canada.* ★3 (either term, 3-0-0) Formerly EDFDN 351.

EDFDN 431. *The Education of Selected Minority Groups in Western Canada: An Historical Study.* ★3 (either term, 3-0-0). An examination of the education of immigrants and their children since Confederation with special attention to the content and agencies of Canadianization. Formerly EDFDN 353.

EDFDN 432. *The Education of Native Peoples in Canada: An Historical Study.* ★3 (either term, 3-0-0). An examination of the education of Indian, Metis, and Eskimo peoples with special attention to church-state and federal-provincial relations. Formerly EDFDN 355.

EDFDN 433. *The Progressive Education Movement in Canada.* ★3 (either term, 3-0-0). An historical study of the influence of 'progressive education' in the United States on Canadian education since 1890. Formerly EDFDN 357.

EDFDN 440. *History of Educational Thought to Rousseau.* ★3 (either term, 3-0-0). A study of the writers who have influenced educational theories and practices in the Western World to Rousseau. Formerly EDFDN 495.

EDFDN 441. *History of Educational Thought in Modern Times.* ★3 (either term, 3-0-0). A study of writers who have influenced educational theories and practices in the Western World since Rousseau. Formerly EDFDN 497.

EDFDN 442. *Political Dimensions of Educational Theory and Practice: An Historical Study.* ★3 (either term, 3-0-0). Formerly EDFDN 483.

EDFDN 450. *The Aims of Education: A Philosophical Study.* ★3 (either term, 3-0-0). An introduction to the language and techniques of contemporary philosophy in discussions relating to the aims of education. Formerly EDFDN 491.

EDFDN 452. *Education and Theories of Knowledge: A Philosophical Approach.* ★3 (either term, 3-0-0). Formerly EDFDN 447.

EDFDN 453. *Logic in Teaching.* ★3 (either term, 3-0-0). A study of logical techniques employed by classroom teachers including definition, explanation and justification. Emphasis will be on the application of these techniques. Formerly EDFDN 449.

EDFDN 454. *Social Philosophy and Education.* ★3 (either term, 3-0-0). An examination of some basic concepts of social philosophy and their relation to education. Formerly EDFDN 493

EDFDN 456. *Moral Philosophy and Education.* ★3 (either term, 3-0-0). Relevance to education of contemporary theories about moral judgment and moral obligation. Formerly EDFDN 445.

EDFDN 460. *Sociology in Educational Context.* ★3 (either term, 3-0-0). Concepts, principles and methods of sociology for students of education. (Not open to students with credit in SOC 202 or SOC 403.) Formerly EDFDN 403.

EDFDN 461. *School and Community.* ★3 (either term, 3-0-0). The school in the context of community culture and structure. Formerly EDFDN 415.

EDFDN 462. *The Sociology of the School.* ★3 (either term, 3-0-0). Prerequisite: SOC 202 or SOC 403 or EDFDN 460 or equivalent. Formerly EDFDN 417.

EDFDN 463. *Youth, Social Change and Socializing Agencies.* ★3 (either term, 3-0-0). Formerly EDFDN 419.

EDFDN 470. *Issues in Contemporary Education.* ★3 (either term, 3-0-0). A critical examination of selected educational issues. Formerly EDFDN 451.

EDFDN 472. *Theoretical Foundations of Education in the Elementary School.* ★3 (3-0-0; 0-0-3). Restricted to Plan B students only. Formerly EDFDN 399.

EDFDN 474. *Contemporary Issues in the Education of Native Peoples: A Social Science Perspective.* ★3 (either term, 3-0-0). An analysis of current issues of debate in Indian, Metis and Eskimo education, with special reference to their social origins. Formerly EDFDN 455.

Graduate Courses

EDFDN 500. *Education Seminar.* ★0. Non-credit; hours to be arranged. Prerequisite: Consent of the Department.

EDFDN 501. *Conference Course on Selected Topics.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 502. *Conference Course on Selected Topics.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDFDN 510. *Education from an Anthropological Perspective.* ★3 (either term, 3-0-0) Formerly EDFDN 509.

EDFDN 512. *Anthropological Theory and Education.* ★6 (3-0-0). Formerly EDFDN 526.

EDFDN 521. *Studies of Educational Change in Western Nations.* ★3 (either term, 3-0-0) Formerly EDFDN 571.

EDFDN 522. *Functions of Education in the Development of Emerging Nations.* ★3 (either term, 3-0-0) Formerly EDFDN 573.

EDFDN 523. *Development Theory and Education.* ★3 (either term, 3-0-0). An examination of the meaning of the concept "Societal Development". A review of theories of development put forward by selected writers, and an analysis of the role of education in the development process, with particular attention to the Third World. Prerequisite: Consent of the Department. Formerly EDFDN 575.

EDFDN 530. *History of Education in Canada.* ★3 (either term, 3-0-0). A survey of studies in the history of formal and informal educational institutions in Canada, and their interrelationship with Canadian society. Formerly EDFDN 504.

EDFDN 532. *Topics in the History of Education in Western Canada.* ★3 (either term, 3-0-0) Formerly EDFDN 587.

EDFDN 534. *Topics in the History of Education in Eastern Canada.* ★3 (either term, 3-0-0) Formerly EDFDN 585.

EDFDN 540. *History of Modern Education.* ★3 (either term, 3-0-0) Formerly EDFDN 503.

EDFDN 541. *History of Higher Education.* ★3 (either term, 3-0-0). Formerly EDFDN 579.

EDFDN 542. *History of Education in the United States Before 1900.* ★3 (either term, 3-0-0) Formerly EDFDN 583.

EDFDN 543. *History of Education: Method and Structure.* ★3 (either term, 3-0-0) Formerly EDFDN 589.

EDFDN 544. *History of Education as a Field of Study: Its Emergence and Development.* ★3 (either term, 3-0-0).

EDFDN 545. *Studies in the History of Schooling and Curriculum.* ★3 (either term, 3-0-0).

EDFDN 546. *Childhood and Childrearing in Western Culture: An Historical Perspective.* ★3 (either term, 3-0-0).

NT D 546. *Soviet and East European Studies: An Interdisciplinary Seminar.* ★6 (3-0-0).

EDFDN 547. *History of English Education Since the Industrial Revolution.* ★3 (either term, 3-0-0).

EDFDN 550. *Philosophical Analysis and Education.* ★3 (either term, 3-0-0) Formerly EDFDN 505.

EDFDN 551. *Philosophy of Education I.* ★3 (either term, 3-0-0). Formerly EDFDN 591.

EDFDN 552. *Philosophy of Education II.* ★3 (either term, 3-0-0). Formerly EDFDN 593.

EDFDN 553. *Philosophical Analysis of Teaching.* ★3 (either term, 3-0-0) Formerly EDFDN 531.

EDFDN 554. *Philosophical Foundations of Educational Research.* ★3 (either term, 3-0-0) Formerly EDFDN 533.

EDFDN 555. *Moral Concepts in Education.* ★3 (either term, 3-0-0). Formerly EDFDN 537.

EDFDN 556. *The Educational Theory of a Selected Philosopher.* ★3 (either term, 3-0-0).

EDFDN 557. *Learning and the Philosophy of Knowledge.* ★3 (either term, 3-0-0).

EDFDN 560. *Education from a Sociological Perspective.* ★3 (either term, 3-0-0) Formerly EDFDN 507.

EDFDN 561. *Community Education: A Sociological Perspective.* ★3 (either term, 3-0-0). The organization and processes of community education at the local, provincial and national levels of social interaction as seen from the theory and research of contemporary sociology. Formerly EDFDN 511.

EDFDN 562. *Development and Theory of Sociology of Education.* ★3 (either term, 3-0-0) Formerly EDFDN 513.

EDFDN 563. *Research Methods in Sociology of Education.* ★3 (either term, 3-0-0) Formerly EDFDN 515.

EDFDN 564. *Education and Social Change.* ★3 (either term, 3-0-0). Formerly EDFDN 517.

EDFDN 565. *Sociology of Higher Education.* ★3 (either term, 3-0-0). Formerly EDFDN 519.

EDFDN 601. *Conference Course on Selected Topics.* ★3 (either term, 3-0-0).

EDFDN 602. *Conference Course on Selected Topics.* ★6 (3-0-0).

EDFDN 620. *Comparative and International Education.* ★6 (0-3s-0).

EDFDN 640. *History of Education.* ★6 (0-3s-0).

EDFDN 641. *History of Education: Historiography.* ★6 (0-3s-0).

EDFDN 642. *History of Education: Selected Areas.* ★6 (0-3s-0).

EDFDN 650. *The Nature of Philosophy in Education.* ★6 (0-3s-0).

EDFDN 651. *Traditional Philosophies of Education.* ★6 (0-3s-0).

EDFDN 652. *Analytic Philosophy of Education.* ★6 (0-3s-0).

EDFDN 660. *Sociology of Education.* ★6 (0-3s-0).

EDFDN 661. *Sociological Theory in Education.* ★6 (0-3s-0).

EDFDN 662. *Sociology of Education: Research Methodology.* ★6 (0-3s-0).

EDFDN 900. *Non-Thesis Project.* ★6 (variable). Supervised individual project. Restricted to non-thesis students in Educational Foundations.

74.8 Education — Industrial and Vocational

EDIND 207. *Drafting for Industrial Arts Teachers.* ★3 (either term, 2-1s-4). Development of necessary techniques for teaching and applying drafting in an industrial arts setting.

EDIND 211. *Materials I. Metals and Materials Testing.* ★3 (either term, 2-1s-4). Study of the processes and machines inherent in the metal and material testing technologies.

EDIND 213. *Materials II. Woods, Plastics, and Earths.* ★3 (either term, 2-1s-4). Study of the processes and machines inherent in the wood, plastic and earth technologies.

EDIND 223. *Industrial Practicum.* ★2 (17 weeks).

EDIND 233. *Technology I. Power Technology.* ★3 (either term, 2-1s-4). Study of energy conversion systems; and energy transmission and control.

EDIND 235. *Technology II. Graphics Technologies.* ★3 (either term, 2-1s-4). Study of the processes, procedures and materials inherent in the graphics technologies.

EDIND 237. *Technology III. Electronic and Computer Technologies.* ★3 (either term, 2-1s-4). Study of the concepts and practices inherent in the electrical, electronic, and computer technologies.

EDIND 243. *Industrial Practicum.* ★2 (17 weeks).

EDIND 245. *Introduction to Vocational Technical Education.* ★3 (either term, 3-0-0). Background and role of vocational education in Canada and abroad, including the early influences of apprenticeship and guilds.

EDIND 323. *Industrial Practicum.* ★2 (17 weeks).

EDIND 343. *Industrial Practicum.* ★4 (33 weeks).

EDIND 385. *Methods of Performance Evaluation in Vocational Education.* ★3 (Second Term, 3-0-0).

EDIND 390. *Occupationally Based Instructional Planning.* ★3 (either term, 3-0-0). This course focuses on the following topics as they relate to industrial and vocational education: mastery learning; vocational program goals and objectives;long range curriculum planning; occupational analysis processes; writing preformance objectives; psycomotor skill development. Prerequisite: EDIND 245. Corequisite: EDPSY 371.

EDIND 391. *Multiple Activity Laboratory I.* ★3 (either term, 3-0-3). Prerequisite / Corequisite: EDIND 211, 213, 233, 235, 237.

EDIND 392. *Industrial Arts Activities for Elementary Teachers.* ★3 (Second Term, 3-0-3).

EDIND 395. *Man and Technology I.* ★3 (either term, 2-1s-4). Study of the interrelationship of man and technology utilizing simulated industrial environment.

EDIND 396. *Skills and Modes of Teaching Vocational Education.* ★3 (either term, 2-0-2). A study of a variety of teaching techniques as they may be used in vocational education laboratories. Emphasis is placed on application of concepts with practice in micro-teaching and peer-teaching settings. Considerable time is devoted to the study of student-teacher relationships, communications, problems and conflict resolution. EDIND 396 is intended as the methods course preparatory for the Phase II practicum and Professional Term. Prerequisite or corequisite: ED PR 251, EDPSY 371.

EDIND 412. *Materials I-A.* ★3 (either term, 2-1s-4). Further study of Metals. Prerequisite: EDIND 211.

EDIND 416. *Materials II-A.* ★3 (either term, 2-1s-4). Further study of Woods, Plastics, and Earths. Prerequisite: EDIND 213.

EDIND 423. *Industrial Practicum.* ★4 (34 weeks).

EDIND 434. *Technology I-A.* ★3 (either term, 2-1s-4). Further study of Power Technology. Prerequisite: EDIND 233.

EDIND 436. *Technology II-A.* ★3 (either term, 2-1s-4). Further study of Graphics Technologies. Prerequisite: EDIND 235.

EDIND 438. *Technology III-A.* ★3 (either term, 2-1s-4). Further study of Electronic and Computer Technologies. Prerequisite: EDIND 237.

EDIND 443. *Industrial Practicum.* ★1 (8 weeks).

EDIND 457. *Multiple Activity Laboratory II.* ★3 (either term, 2-1s-4). Synthesizing activities with content from the material and technology components of productive society.

EDIND 465. *Manpower and Curriculum Implications.* ★3 (Second Term, 3-0-0). Further study of vocational technical education including implications for manpower training.

EDIND 477. *Man and Technology II.* ★3 (either term, 2-1s-4). Study of the teaching of the interrelationship of man and technology.

EDIND 485. *Performance Evaluation in Industrial and Vocational Education.* ★3 (either term, 3-0-0). This course includes selected aspects of evaluation of importance to teachers who specialize in technical, vocational or industrial arts education. Various techniques of assessing learning or behavior in the cognitive, affective, and psychomotor domains are considered. The course is taught from an applications point of view. Specific theories of evaluation are not considered as such, but constructs, principles and techniques of measurement are considered from the practical perspective of those who teach industrial arts, vocational or technical education. This course is integrated with the practicum in a professional term. Integration is both in terms of content and scheduling. Prerequisites: EDIND 390 and EDIND 391. Corequisite: EDIND 497, ED PR 357, ED PR 358, ED PR 359.

EDIND 490. *Writing of Learning/Training Objectives.* ★3 (either term, 3-0-0). Writing detailed learning and/or training objectives for competency based programs.

EDIND 492. *Technical Communications.* ★3 (either term, 3-0-0). Instruction and intensive practice in technical communication skills. Emphasis on organization and production of the two main forms of technical writing: instructional material and technical reports; treatment of other types of technical writing such as abstract writing and technical correspondence. Diagnosis and correction of individual writing faults.

EDIND 494. *Trade Training and Industry in Britain and Continental Europe.* ★6 (8-5s-20). A study of European training and institutions which will include lecture trips and seminars held at London City and Guilds, Holland's Bemetel Institute, etc., aimed at providing vocational educators and industrial training personnel with a deeper understanding of European industry and current industrial training programs and methods. Prerequisite: EDIND 245 and EDIND 465 or consent of the Department. Note: This course is given in Europe during the Summer Session only.

EDIND 496. *Individual Directed Study.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDIND 497. *Curriculum Development in Industrial and Vocational Education.* ★3 (either term, 3-0-3). A study of selecting and sequencing learning activities with application to course, unit and lession planning for the business and industrial education teacher. Methods of managing the laboratory experiences, budgeting and ordering supplies, and record keeping are dealt with. This course, along with EDIND 485, is integrated with practicum in a professional term. Integration is in terms of both content and scheduling. Prerequisites: ED PR 351, EDIND 390 or EDIND 391. Corequisite: EDIND 485, ED PR 357, ED PR 358, ED PR 359.

EDIND 498. *Individual Directed Laboratory Study.* ★3 (either term, 3-0-3). Prerequisite: Consent of the Department.

Graduate Courses

EDIND 500. *Industrial and Vocational Education Seminar.* ★0. Non-credit. Hours to be arranged. Reports and discussions by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures.

EDIND 509. *Development and Principles of Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 511. *Curriculum and Instruction in Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 519. *Supervision and Planning of Industrial and Vocational Facilities and Programs.* ★3 (either term, 3-0-0).

EDIND 521. *Evaluation of Industrial and Vocational Education Programs.* ★3 (either term, 3-0-0).

EDIND 539. *Technological Assessment and its Implication for Industrial and Vocational Education Curricula.* ★3 (either term, 3-0-0).

EDIND 541. *Technological Forecasting and its Implication for Industrial and Vocational Education Curricula.* ★3 (either term, 3-0-0).

EDIND 549. *Survey of Occupations — Conference Seminar I.* ★3 (either term, 1-0-3).

EDIND 551. *Survey of Occupations — Conference Seminar II.* ★3 (either term, 1-0-3).

EDIND 585. *Individual Directed Laboratory Study.* ★3 (either term, 3-0-3).

EDIND 587. *Individual Directed Study.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDIND 589. *Organization of Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 591. *Problems and Trends in Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 593. *Survey of Industrial and Vocational Education Research I.* ★3 (either term, 3-0-0).

EDIND 595. *Survey of Industrial and Vocational Education Research II.* ★3 (either term, 3-0-0).

EDIND 900. *Non-Thesis Project.* ★6 (variable).

74.9 Education — Practicum

ED PR 200. *Student Teaching: Elementary.* ★6 (6 weeks). Note: Available only with permission of the Dean.

ED PR 201. *Student Teaching: Elementary.* ★3 (2 weeks).

ED PR 202. *Student Teaching: Elementary.* ★3 (2 weeks).

ED PR 248. *Practicum in Intercultural Education I.* ★((Intersession Experience).

ED PR 251. *A Study of Classroom Behavior.* ★3 (either term, 2-0-4). An education option in the practicum (student teaching) component.

ED PR 252. *Secondary School Teaching Practicum.* ★6 (0-6L-0). An Education option involving practical classroom experience in the area of the student's specialization.

ED PR 301. *Student Teaching: Elementary.* ★3 (4 weeks).

ED PR 302. *Student Teaching: Elementary.* ★3 (3 weeks).

ED PR 310. *Student Teaching in the Elementary School — II.* ★ (4 weeks).

ED PR 330. *Student Teaching in the Elementary School — III.* ★ (8 weeks).

ED PR 331. *Student Teaching in the Elementary School — III.* ★ (9 weeks). Restricted to students in the B.Ed. A/D program.

ED PR 348. *Practicum in Intercultural Education II.* ★ (Intersession Experience).

ED PR 350. *Student Teaching in the Secondary School.* ★6 (weeks). Note: Available only with permission of the Dean.

ED PR 351. *Student Teaching — Phase II (Industrial Arts and Vocational Education).* ★3 (4 weeks).

ED PR 353. *Student Teaching in the Secondary School — II.* ★ (4 weeks).

ED PR 354. *Campus Based Practicum (Secondary Education).* ★3 (0-3L-0).

ED PR 355. *Student Teaching in the Secondary School — III.* ★3 (4 weeks).

ED PR 356. *Student Teaching in the Secondary School — III.* ★3 (4 weeks).

ED PR 357. *Campus Based Practicum (Industrial Arts and Vocational Education).* ★3 (0-3L-0).

ED PR 358. *Student Teaching — Phase III (Industrial Arts and Vocational Education).* ★3 (4 weeks).

ED PR 359. *Student Teaching — Phase III (Industrial Arts and Vocational Education).* ★3 (4 weeks).

ED PR 400. *Student Teaching in the Elementary School.* ★6 (6 weeks). Note: Available only with permission of the Dean.

ED PR 401. *Student Teaching: Elementary.* ★3 (3 weeks).

ED PR 402. *Student Teaching: Elementary.* ★9 (7 weeks).

ED PR 450. *Student Teaching in Secondary School.* ★6 (6 weeks). Note: Available only with permission of the Dean.

ED PR 451. *Student Teaching.* ★3 (3 weeks).

ED PR 453. *Student Teaching.* ★3 (3 weeks).

ED PR 454. *Student Teaching at Post-Secondary Level: I.* ★3 (3 weeks).

ED PR 455. *Student Teaching at Post-Secondary Level: II.* ★3 (3 weeks).

74.10 Education — Psychology

EDPSY 251. *Introduction to Exceptional Children.* ★3 (either term, 3-0-1). Special Education students only.

EDPSY 255. *Developmental and Learning Characteristics of Exceptional children.* ★3 (3-0-0). Formerly EDPSY 351.

EDPSY 263. *Introduction to Educational Psychology: Development.* ★3 (either term, 3-2-0). Formerly EDPSY 261.

EDPSY 271. *Introduction to Educational Psychology: Learning.* ★3 (either term, 1.5-1.5s-0).

ED PSY 329. *Educational Psychology of Adolescence.* ★3 (either term, 3-0-0).

EDPSY 341. *Psychology of Exceptional Children and Youth.* ★3 (either term, 3-0-0). No prerequisites. Not to be taken by students with credit in EDPSY 251/253.

EDPSY 343. *Education of Exceptional Children and Youth.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 341. Not to be taken by students with credit in EDPSY 251/253.

EDPSY 351. *Developmental and Learning Characteristics of Exceptional Children.* ★3 (either term, 3-0-0). Prerequisites: EDPSY 251 and 253; or consent of the Department. Special Education students only.

EDPSY 355. *Psychoeducational Diagnosis and Assessment of Exceptional Children.* ★3 (either term, 3-0-1). Prerequisites: EDPSY 251 and 255. Corequisite: EDPSY 357.

EDPSY 357. *Behavioral Management of Exceptional Children.* ★3 (3-0-1). Prerequisite: EDPSY 251 and 255. Corequisite: EDPSY 355.

EDPSY 359. *Instructional Materials and Programming Methods for Special Education.* ★2 (2-0-1). Prerequisites: EDPSY 251, 255, 355, and 357.

EDPSY 361. *Seminar and Clinical Practicum: Exceptional Children.* ★3 (0-2s-4). Prerequisites: EDPSY 351 and 355. Special Education students only.

EDPSY 363. *Introduction to Educational Psychology: Development.* ★3 (either term, 3-2-0). Restricted to students enrolled in the B.Ed. A/D program.

ED PSY 371. *Learning, Instructional Psychology and Educational Practice.* ★3 (either term, 3-2s-0).

EDPSY 411. *Introduction to Guidance.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 263 or equivalent.

EDPSY 412. *The Psychology of Classroom Communication.* ★6 (3-0-1). Prerequisite: EDPSY 263 or equivalent.

EDPSY 419. *Educational and Vocational Guidance in the Classroom.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 263 or equivalent.

EDPSY 421. *Personal and Social Dynamics in Education.* ★3 (either term, 3-0-0) Prerequisite: EDPSY 263 or equivalent.

EDPSY 425. *Psychology of Confluent Education.* ★3 (either term, 3-0-3). Prerequisite: EDPSY 263 and consent of the Department.

EDPSY 453. *Interdisciplinary Perspectives on Exceptionality.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 361 or consent of the Department. Special Education students only.

EDPSY 459. *Seminar in Special Education.* ★3 (either term, 1-2s-0). Prerequisite: EDPSY 361 or consent of the Department. Special Education students only.

EDPSY 461. *Seminar and Classroom Practicum: Exceptional Children.* ★3 (0-1s-5). Prerequisite: EDPSY 361. Prerequisite or corequisite: EDPSY 357. Special Education students only.

EDPSY 467. *Learning and Development in the Elementary School.* ★3 (3-0-0; 0-0-3). Prerequisite: EDPSY 263 or equivalent. Note: Restricted to Plan B students only.

EDPSY 468. *Learning and Development in the Elementary School.* ★6 (3-0-3). Prerequisite: EDPSY 263 or equivalent.

EDPSY 469. *Human Development and Education.* ★3 (either term, 3-0-0) Prerequisite: EDPSY 263 or equivalent.

EDPSY 471. *Learning and Instruction.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 371 or consent of the Department.

EDPSY 473. *Language and Cognition in the Education of the Child.* ★3 (either term, 3-0-0) Prerequisite: EDPSY 263 or equivalent.

EDPSY 475. *Individual Differences in Education.* ★3 (either term, 3-0-0). Prerequisites: EDPSY 263 or equivalent.

EDPSY 477. *Bilingualism and Cognition in the Education of the Child.* ★3 (either term, 3-0-0). Prerequisites: EDPSY 263 or equivalent.

EDPSY 479. *Introduction to Computer Assisted Instruction.* ★3 (First Term, 3-0-3). Prerequisite: EDPSY 263; or corequisite: EDPSY 371.

EDPSY 481. *Problems in Implementation and Evaluation of Computer Based Instructional Systems.* ★3 (Second Term, 1-0-3). Prerequisite: EDPSY 479

EDPSY 487. *Principles of Classroom Measurement.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 263 or consent of the Department.

EDPSY 489. *Test Construction for Teachers.* ★3 (either term, 3-0-0). Prerequisite: EDPSY 263 or consent of the Department.

EDPSY 497. *Senior Seminars.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period.

EDPSY 498. *Senior Seminar in Educational Psychology.* ★6 (0-3s-0). Content varies from year to year. Topics announced prior to registration period. Prerequisite: Consent of the Department.

EDPSY 499. *Directed Individual Study in Educational Psychology.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

Graduate Courses

EDPSY 501. *Nonparametric Statistical Inference in Educational Research.* ★3 (either term, 3-0-0).

EDPSY 502. *Introduction to Educational Research.* ★6 (3-0-3).

EDPSY 504. *Statistics and Research Design in Education.* ★6 (3-0-3). Prerequisite: EDPSY 502 or equivalent.

EDPSY 510. *Counselling Theory I.* ★6 (2-0-4). Prerequisite or corequisite: EDPSY 515 or consent of the Department.

EDPSY 511. *Vocational Development and Choice.* ★3 (either term, 3-0-0).

EDPSY 512. *Seminar and Practicum in Counselling I.* ★6 (2-1.5s-4). Prerequisites or corequisites: EDPSY 515 and 510 or equivalent and consent of the Department.

EDPSY 513. *Group Assessment in Guidance and Counselling.* ★3 (either term, 3-0-1). Prerequisite: EDPSY 487 or equivalent; or consent of the Department.

EDPSY 515. *Theories of Personality.* ★3 (either term, 3-0-0).

EDPSY 517. *Religious and Moral Development and Education.* ★3 (either term, 3-0-0).

EDPSY 518. *Seminar and Practicum in Group Counselling.* ★6 (0-3s-4). Prerequisite: EDPSY 512; or equivalent.

EDPSY 519. *Seminar in Elementary School Counselling.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

EDPSY 521. *Interpersonal Relations in Education.* ★3 (either term, 0-0-3). Prerequisite: Consent of the Department.

EDPSY 524. *Seminar and Practicum in School Psychology I.* ★6 (3-0-3). Prerequisite: Consent of the Department.

EDPSY 531. *Psychology of Exceptional Children.* ★3 (either term, 3-0-0). An overview of the psychology of exceptional

children with emphasis on intellectual and emotional deviance, learning disability, mental retardation, sensory deficits and the problems of deprivation.

EDPSY 533. *Advanced Course in Psychoeducational Diagnosis.* ★3 (First Term, 3-0-1). To provide skill in administration and interpretation of a variety of psychoeducational measures which show potential in advancing our understanding of exceptional children.

EDPSY 535. *Educational Programming from Psychoeducational Data.* ★3 (Second Term, 3-0-1). Prerequisite: EDPSY 533 or consent of the Department.

EDPSY 537. *Task Analysis and Instructional Design in Special Education.* ★3 (First Term, 0-4L-0). To provide skill in developing curriculum materials and instructional sequencing and criterion referenced tests through task analysis.

EDPSY 538. *Practicum in Special Education.* ★6 (0-4L-0). Supervised practicum in a variety of special education settings. Prerequisite: EDPSY 531.

EDPSY 539. *Behavior Management in Schools.* ★3 (Second Term, 0-4L-0). To provide skill in implementing behavior management practices in classroom settings as well as skills for assisting teachers to implement behavior management techniques.

EDPSY 541. *Development and Learning of Exceptional Children.* ★3 (either term, 3-0-0). A consideration of the value of current theories in learning and development for understanding exceptional children. Prerequisites or corequisites: EDPSY 531, 569 and 571 or consent of the Department.

EDPSY 542. *Theory and Research in Mental Retardation.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 544. *Seminar on Research in Special Education.* ★6 (0-3s-0). Prerequisite or corequisite: EDPSY 502 or equivalent.

EDPSY 546. *Seminar in Psychopathology of the Child.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDPSY 555. *Cross-Cultural Psychology: Cognitive Development.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDPSY 560. *Seminar and Research in Developmental Psychology.* ★6 (0-3s-1). Prerequisite: Consent of the Department. Note: All students registered in the basic area must take EDPSY 560 instead of EDPSY 569.

EDPSY 562. *Comparative Educational Psychology: Soviet and Western.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 568. *Seminar and Research in Learning.* ★6 (0-3s-1). Prerequisite: Consent of the Department. Note: All students registered in the basic area must take EDPSY 568 instead of EDPSY 571.

EDPSY 569. *Advanced Educational Psychology: Development.* ★3 (either term, 3-0-0).

EDPSY 571. *Advanced Educational Psychology: Learning.* ★3 (either term, 3-0-0).

EDPSY 578. *Psychology of Language, Cognition and Bilingualism.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 580. *Seminar and Research in Educational Measurement.* ★6 (3-2s-0). Prerequisite: EDPSY 502, its equivalent or consent of the Department.

EDPSY 591. *Social Psychology and Education.* ★3 (either term, 3-0-0).

EDPSY 592. *Seminar and Research in the Social Psychology of School and Classroom.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDPSY 594. *Core Seminar.* ★12 (0-6s-0). An integrated course limited to graduate students requiring the foundation normally provided through EDPSY 515, 569, 571, and 591. Subsequent registration in these courses will not be approved.

EDPSY 597. *Special Seminars.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

EDPSY 598. *Special Seminars.* ★6 (0-3s-0). Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

EDPSY 599. *Individual Directed Reading and Research.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDPSY 610. *Counselling Theory II.* ★6 (3-0-0).

EDPSY 612. *Seminar and Practicum in Counselling II.* ★6 (3-3s-3). Incorporates internship.

EDPSY 616. *Research in Counselling.* ★6 (3-0-0).

EDPSY 620. *Personality, Affect, and Cognition.* ★6 (3-0-0).

EDPSY 624. *Seminar and Practicum in School Psychology II.* ★6 (3-0-3).

EDPSY 640. *Special Education.* ★6 (3-0-0).

EDPSY 660. *Developmental Psychology.* ★6 (3-0-0).

EDPSY 676. *Psychology of Learning.* ★6 (3-0-0).

EDPSY 680. *Educational Measurement.* ★6 (3-0-3).

Note: § 74.11 reserved.

74.12 *Courses Offered by Other Faculties*

NOTE: This list of courses offered by other faculties is included for the use of first year students to provide an overview of the kinds of courses offered by other faculties. It also includes some senior courses which are required for certain teaching specializations. All students should consult the appropriate Faculty Calendars for more comprehensive course information.

74.12.1 ACCOUNTING

ACCTG 202. *Introductory Accounting.* ★3 (either term, 3-1.5s-0). Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors and other external decision-makers. Prerequisites: ECON 200 or 201/202.

74.12.2 AGRICULTURAL ECONOMICS — DEPARTMENT OF RURAL ECONOMY

AG EC 203. *Introduction to Agricultural Economics.* ★3 (First Term, 3-0-0). Economic and social issues in food production and consumption; prices, costs, and incomes; nature and causes of farm problems; role of agriculture in the overall economy; world food situation; public policies affecting agriculture. Note: Not recommended for students with credit in any other agricultural economics course.

74.12.3 ANIMAL SCIENCE

AN SC 210. *Equine Physiology and Nutrition.* ★3 (First Term, 3-0-0). Application of the principle of digestive and metabolic physiology. Nutrient requirements of the horse; sources of energy and nutrients; feed formulation.

74.12.4 ANTHROPOLOGY

ANTHR 202. *Man and Culture.* ★6 (3-0-0). An introduction to anthropological thought concerning such topics as race, evolution, culture growth and culture change. Note: Not open to students with credit in ANTHR 306 or 307.

74.12.5 ART AND DESIGN

ART H 201. *Introduction to the History of Art I.* ★3 (either term 3-0-0). Introduction to European Art from the Middle Ages to the 17th Century by analysis of selected works and movements. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 250.

ART H 202. *Introduction to the History of Art II.* ★3 (either term 3-0-0). Introduction to the art of the 17th, 18th, 19th and 20th Centuries by analysis of selected works and movements Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 251.

ART 231. *Visual Fundamentals.* ★6 (2-0-4). A studio based introduction to the exploration and production, in two and three dimensions, of visually expressed information. Note: Not open to students with credit in ART 232.

74.12.6 ASTRONOMY

ASTRO 253. *Astronomy.* ★6 (3-0-0). This is a general course in astronomy. Major topics presented include the solar system properties of stars, galaxies and cosmology. The results from manned and unmanned space probes are included in the discussions. Emphasis is placed on the physical processes

responsible for astronomical phenomena. Prerequisite: Mathematics 30 and Physics 30 or PHYS 203. Students are advised to have knowledge of trigonometry.

ASTRO 353. *Survey of Astronomical Theories and Techniques.* ★6 (3-0-0). This course is intended primarily for students in the Faculties of Education and Arts. Our current knowledge of the universe is discussed using a descriptive approach avoiding mathematical details wherever possible. Emphasis is placed on understanding our modern picture of the universe. Techniques of observation and analysis are studied through a series of practical exercises. This course will include viewing experience, using the observatory on the roof of the Physics Building, whenever appropriate. Prerequisites: It is recommended that students have credit in Mathematics 30 and Physics 30 or PHYS 203. Credit may be obtained in only one of ASTRO 253 or 353.

ASTRO 410. *Astrophysics.* ★6 (3-0-0). Summary of the concepts in physics and astronomy which are relevant to astrophysics; stellar spectra, atmospheres, interiors and evolution; galactic structure; cosmology. Prerequisites: MATH 202 or 203 and 204; PHYS 240. Some additional knowledge of mathematics (e.g., MATH 302/303) and astronomy (e.g., ASTRO 253) would be advantageous.

NOTE: All three courses described include viewing experience using the observatory on the roof of the Physics Building whenever appropriate.

74.12.7 BIOLOGY

BIOL 130. *Introductory Biology.* ★6 (3-0-3). A basic biology course emphasizing the diversity and interrelations of organisms, the relationships between form and function, heredity, cellular structure, and ecological principles. Note: Not open to students with credit in Biology 30.

BIOL 210. *Biology and the Modern World.* ★3 (either term, 3-0-3). Biological basis for an ecology of man including human origins, evolution, biological peculiarities and exploding populations; man's place in and influence on the biosphere; speculation concerning man's future. Demonstration laboratories and discussions. No prerequisite. This course may be combined with ENT 209 to make a full course in biological science.

BIOL 296. *Evolutionary Biology.* ★3 (either term, 3-0-3). The numbers and kinds of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: Biology 30.

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30.

BIOL 298. *Environmental Biology.* ★3 (either term, 3-0-3). The basic principles and concepts of ecology. Emphasis on structure and function of populations, communities, and ecosystems. Laboratory to include ecological experiments, demonstrations, and discussions. Prerequisite: Biology 30.

BIOL 299. *Biological Function.* ★3 (either term, 3-0-3). Comparative physiology of animals and higher plants from the standpoint of nutrition, energetics, gas exchange, circulation, ionic and osmotic relations and control systems. Prerequisite: Biology 30.

74.12.8 CHEMISTRY

CHEM 200. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry, electrochemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: CHEM 100, or Chemistry 30, or equivalent.

CHEM 202. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics with applications to inorganic chemistry. Designed for students who are taking or have taken a university level mathematics course. Prerequisite: CHEM 100, or Chemistry 30, or equivalent. Corequisite or prerequisite: MATH 202 or 203 or equivalent.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (e.g., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: CHEM 100, or Chemistry 30 or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Such students may enroll in CHEM 250 only if written consent of the Department is obtained.

74.12.9 CLASSICS

CLASS 201. *Literature of Greece and Rome.* ★3 (either term, 3-0-0). An introductory survey in English translation of Greek and Latin literature in its social, artistic and cultural background. A limited number of major works, representing the most important genres, will be studied. May not be taken concurrently with or subsequent to CLASS 359/362.

CLASS 202. *Greek and Roman Mythology.* ★3 (either term, 3-0-0). A survey of classical mythology with readings in translation from various ancient authors as well as from modern scholarly works. Note: Formerly part of CLASS 240.

CLASS 230. *Introduction to the Ancient Near East and Greece.* ★3 (either term, 3-0-0). An introductory course in the history of the Ancient Near East and Greece from the Neolithic Age to the Fourth Century A.D. May not be taken concurrently with or subsequent to CLASS 363/364.

CLASS 231. *Introduction to Rome and the West.* ★3 (either term, 3-0-0). An introductory course in the history of Rome and the western Mediterranean to the collapse of the Roman Empire. May not be taken concurrently with or subsequent to CLASS 365/366 and 371/372.

CLASS 241. *Ancient Science and Technology.* ★3 (either term, 3-0-0). A survey of ancient science and technology in the Middle Eastern, Greek and Roman civilizations.

CLASS 250. *The Greek World.* ★3 (either term, 3-0-0). Greek life and society illustrated by archaeological discoveries; the Bronze Age, the city, temples, Athens, Sparta, Greek art and architecture, trade and warfare. Slides, films, and other materials.

CLASS 251. *The Roman World.* ★3 (either term, 3-0-0). A study of Roman society illustrated by archaeological discoveries; city life, housing, town planning, games, trade, shipping and the army. Slides, films, coins, other materials. Note: formerly a full-session course.

CLASS 260. *Greek and Latin Etymology.* ★3 (either term, 3-0-0). A study of Greek and Latin words commonly used in English; how these words are built, and how they gain and change in meanings.

74.12.10 DRAMA

DRAMA 243. *Introduction to Oral Communication.* ★3 (either term, 0-6L-0). Exercises in voice and speech improvement; elements of oral communication and interpretation. Note: Formerly part of DRAMA 241. Restricted to B.A. and B.Ed. Drama Majors. Note: Not open to students with credit in DRAMA 245.

DRAMA 245. *Introduction to and Development of Oral Communication.* ★6 (0-4L-0). Exploration of basic techniques of oral communications and oral interpretation drawing from various forms of literature. Note: Not open to students with credit in DRAMA 243, DRAMA 341, and former DRAMA 343.

DRAMA 251. *Improvisation.* ★3 (either term, 0-6L-0). Speech and movement improvisation with an emphasis on imaginative development; introduction to dramatic form.

DRAMA 253. *Improvisational Drama.* ★3 (either term, 0-6L-0). Developing a sense of dramatic form through improvisational and environmental techniques. Prerequisites: DRAMA 251 or DRAMA 250.

74.12.11 ECONOMICS

ECON 201. *Introduction to Micro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy; the distribution of income, inequality and poverty; the use of the environment; government economic policies. Prerequisites: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; national income and monetary

theory; problems of unemployment and inflation; government monetary and fiscal policies; international trade theory, problems and government policies. Prerequisites: Mathematics 20 or Mathematics 33 or consent of the Department.

74.12.12 ENGLISH

NOTE: English 200, 210, or any two 200-level single term courses (including English 290) serve as prerequisites to senior English courses. Senior English courses may not be taken without the necessary prerequisite(s) (including ENGL 305, 306 and 398). A MAXIMUM OF SIX CREDITS in literature at the 200 level may be accepted for credit in a B.Ed. program. English 288 will not serve as a prerequisite to senior English courses.

ENGL 200. *A Survey of English Literature from the Middle Ages to the Twentieth Century.* ★6 (3-0-0). A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ENGL 210. *English Literary Forms.* ★6 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

ENGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0).A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265.

ENGL 270. *Readings in Poetry.* ★3 (either term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry. Prerequisite: ENGL 215.

ENGL 275. *Readings in Prose.* ★3 (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically. Prerequisite: ENGL 215.

ENGL 284. *Canadian Literature in Process.* ★3 (either term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English. Prerequisite: ENGL 215.

ENGL 288. *An Introduction to the English Language.* ★6 (3-0-0). A historical and structural study of the sounds, grammar, and vocabulary of English.

ENGL 290. *The Craft of Writing.* ★3 (Second Term, 3-0-0). A study of techniques of expository writing, intended to increase awareness of the resources of English prose, and to provide intensive practice in using these. Prerequisite: ENGL 215 and consent of the Department.

ENGL 305. *The Development of Children's Literature.* ★3 (either term, 3-0-0). A study of the history of children's literature, with works of representative writers. Note: Not to be taken by students having credit in ENGL 398.

ENGL 306. *Folklore in Children's Literature.* ★3 (either term, 3-0-0). A study of myths, folk-tales, legends and other oral materials drawn into English literature from a variety of cultural traditions. Note: Not to be taken by students having credit in ENGL 398.

ENGL 398. *Children's Literature.* ★6 (3-0-0). A historical and critical study of children's literature in English. It includes books written especially for children and books annexed from English literature by children. The course is divided into two parts: a study of myth and folklore drawn into English literature from various cultural traditions, and a study of works in English. Note:

74.12.13 ENTOMOLOGY

ENT 207. *Agricultural Entomology.* ★3 (either term, 3-0-3). Introdcution to insects and related anthropods emphasizing those aspects of their structure and life history responsible for some of them becoming pests and indicating those aspects towards which control measures can be directed. Principles of integrated control. Prerequisite: Biology 30 or BIOL 130 or equivalent recommended.

ENT 209. *Entomology for Non-Biologists.* ★3 (either term, 3-0-3). Comparisons of the structure, relationships, behavior and place in nature of insects and man. No prerequisite.

74.12.14 FOOD SCIENCE

FD SC 200. *Introduction to Food Science.* ★3 (either term, 3-0-0). Historical and philosophical aspects of food supplies and food processing. World food supply and utilization. Trends in the processing, preservation, handling and utilization of food. Food fads and fallacies. No prerequisite.

74.12.15 FOREST SCIENCE

FOR 200. *Introduction to Forestry.* ★3 (First Term, 3-0-0). A review of the field of forestry and integrated-use forest management including historical development of forestry and logging, wood products, silviculture and reforestation, forest enemies — fire, insects and diseases, forest land uses, conservation and management. Not available for credit to B.Sc. Forestry students.

74.12.16 FRENCH

FREN 201. *First Year University French for Teachers.* ★6 (3-0-2). Designed to teach future teachers of French to speak and to write the language. Three hours of grammar and two hours of audio / visual learning per week. Prerequisite: French 30 or equivalent. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 220 and 222, or CA FR 220 or 222.

FREN 202. *Intermediate First Year University French.* ★6 (3-0-1). Designed for students having French 31 and Francophone students. Prerequisite: French 31 or equivalent. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean FRANC 220 or 222, or CA FR 220 or 222.

FREN 230. *Advanced First Year University French.* ★6 (3-0-2). Designed for Honors students. Students having French 31 and Francophone students require the consent of the Department.

74.12.17 GEOGRAPHY

NOTE: Geography 230 and 231 do not have to be taken in sequence. They are completely separate courses. Either one may be taken without the other, and Geography 231 can be taken before Geography 230.

GEOG 230. *Introductory Physical Geography I.* ★3 (either term, 3-0-2). Introduction to geomorphology; the nature and formation of major landform features of the earth's surface. Rock weathering and slope movements. Landforms developed by erosional and depositional processes of rivers, glaciers, winds, waves and currents. A field trip in the Edmonton area may be offered. Laboratory work required.

GEOG 231. *Introductory Physical Geography II.* ★3 (either term, 3-0-2). Introduction to the atmosphere and biosphere. Physical elements of weather and climate. Causes, changes and patterns of weather. Climatic classification. Spatial and dynamic interrelations of climate, soils and vegetation. Laboratory work required. Note: GEOG 230 does not have to precede GEOG 231.

GEOG 250. *Spatial Organization of Human Activity.* ★3 (either term, 3-0-0). The search for order in man's occupation of the earth and of his distribution across it; maps as techniques for understanding reality.

GEOG 251. *Introduction to Cultural Geography.* ★3 (either term, 3-0-0). The significance of human distribution on the earth. Man's relation to the physical environment; world population problems; cultural patterns in the world.

74.12.18 GEOLOGY

GEOL 202. *Physical Geology.* ★3 (First Term, 3-0-3). Internal structure and composition of the earth; continents and oceans; minerals and rocks; ground water and water supply; erosion, transportation and deposition of sediments; igneous activity and metamorphism; mountain building; plate tectonics. Not available to students with credit in GEOL 301 or 390.

GEOL 203. *Earth History.* ★3 (Second Term, 3-0-3). Geological time; fossils, evolution of the principal groups and man; use of fossils in historical geology; paleography; historical geology; continental drift and polar wandering. Prerequisite: GEOL 202.

GEOL 301. *Earth Science I.* ★3 (First Term, 3-0-0). The nature, origin and evolution of the universe and of planetary systems; the physical properties of the earth and of its environment; the materials and structures of the earth's interior and surface and the processes affecting these regions, such as conti-

nental drift, the formation of ocean basins and mountain building. Note: Not available to students who have taken GEOL 202 or 390.

GEOL 306. *The Succession of Life through Geological Time.* ★3 (Second Term, 3-0-0). The nature of the primitive earth and the origin of self-replicating molecules; the earth environment and its influence on the development of life; modification of the early environment by developing life forms; the nature of the fossil record; the sequence of development and interrelationships of the major animal and plant groups. Not available to students with credit in GEOL 203 or 302.

74.12.19 GERMAN

GERM 100. *Conversational German for Beginners.* ★6 (3-0-2). Designed to lead to mastery of spoken and written German, with strong emphasis on the development of oral communication skills. Not open to students with credit in German 30, GERM 101, or GERM 102.

GERM 101. *Intensive Beginners' German.* ★6 (3-0-2). Designed to develop practical skill in spoken and written German with special emphasis on the acquisition of an extensive vocabulary. Note: Especially for prospective Honors students, students with a concentration in German and students with some previous knowledge of German. Admission only with the consent of the Department.

GERM 102. *Reading German for Beginners.* ★6 (3-0-1). Designed to develop skill in written and spoken German, with strong emphasis on reading and listening comprehension. Note: Not open to students with credit in German 30, GERM 100, or GERM 101.

GERM 200. *First Year University German.* ★6 (3-0-2). Designed to develop ability in speaking, reading and writing German, using modern short stories, cultural readers and audio-visual aids. Prerequisite: German 30, GERM 100, or the equivalent.

GERM 201. *Intensive First Year University German.* ★6 (3-0-2). Designed to develop ability in speaking, reading and writing German with special emphasis on the written skill. Prerequisite: German 30 or GERM 100 or 101 and consent of the Department. Note: Especially for prospective Honors students, students with a concentration in German and for students of native background in German who need special training in grammar and writing.

GERM 202. *Intermediate German.* ★6 (3-0-0). Designed to improve skill in reading and listening comprehension. Texts will exemplify German contributions to European intellectual life. Prerequisite: German 30, GERM 100, 101, 102, or the equivalent.

GERM 306. *German/English Contrast Phonology.* ★3 (First Term, 3-0-0). Phonetic and phonemic analysis of English and German. Contrastive study includes application to teaching and learning German. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 300.

GERM 307. *German/English Contrastive Grammar.* ★3 (Second Term, 3-0-0). Comparison of parts of the two grammars namely the verb, including application to teaching and learning German. Prerequisites: GERM 200, 201, 202 or consent of the Department. Note: Formerly part of GERM 300.

GERM 321. *German Prose in English Translation.* ★3 (First Term, 3-0-0). Analyses of great novels and novellas in English translation from the eighteenth century to contemporary times.

GERM 322. *German Drama in English Translation.* ★3 (Second Term, 3-0-0) Analyses of great dramas in English translation from the eighteen century to contemporary times.

74.12.20 HISTORY

HIST 200. *European History.* ★6 (3-1s-0). The evolution of European society from the decline of the Roman Empire in the West to the present.

HIST 201. *European History Since the Renaissance.* ★6 (3-0-0).

HIST 202. *Introduction to Medieval Europe.* ★6 (3-0-0). Europe from the Fall of Rome to the Renaissance.

HIST 278. *An Introduction to the Study of Canadian History 1500-1867.* ★3 (First Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian history.

HIST 279. *An Introduction to the Study of Canadian History 1867-1967.* ★3 (Second Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian history.

HIST 280. *Asia to 1500.* ★3 (either term, 3-0-0). A survey of the history of Asia to the beginning of the sixteenth century.

HIST 281. *Asia from 1500.* ★3 (either term, 3-0-0). A survey of the history of Asia from the sixteenth century. Prerequisite: HIST 280 or consent of the Department.

74.12.21 HOME ECONOMICS

CL TX 200. *Design in Everyday Living.* ★3 (either term, 3-0-3). An introductory course in design to develop visual awareness. The functional components in our physical environment and their aesthetic qualities are evaluated through problem solving.

CL TX 203. *Clothing Construction and Flat Pattern Design.* ★3 (either term, 2-0-4). Interrelationships of the principles of flat pattern, pattern adjustments and garment fitting. Application of construction principles to design details and fabric characteristics.

CL TX 307. *Experimental Techniques in Clothing Construction.* ★3 (Second Term, 3-0-3). Analysis and modifications of construction techniques in relation to prescribed standards. Study and experimentation in handling fabrics which require special techniques. Prerequisite: CL TX 203 or advanced placement and CL TX 309.

FAM 340. *Management of Family Resources.* ★3 (Second Term, 3-0-1.5). Introduction to the principles of management as applied to the use of family resources.

FAM 350. *Family in Transition.* ★3 (First Term, 3-0-0). An introduction to the study of the family through the issues which surround the family and marriage in contemporary society. Reference to research studies and to historical data will provide the basis of the course. FAM 350 and SOC 371 may not both be taken for credit.

FD NU 222. *Current Topics in Human Nutrition and Foods.* ★3 (First Term, 3-0-0). An introductory course. Selected problems in community nutrition in developed and developing countries. Prerequisite: Chemistry 30 or consent of the instructor. Note: This course is not open to students who have credit in FD NU 325, 327, 464, 465.

74.12.22 LATIN

LATIN 100. *Beginners' Latin.* ★6 (4-0-1). Essentials of grammar, syntax, the reading of easy Latin and prose composition. Secondary emphasis on the connexion of English with Latin.

LATIN 200. *Latin Authors.* ★6 (3-0-0). Practice in the reading of Latin and in the writing of simple Latin sentences. Note: For students with matriculation in Latin 30 or with LATIN 100.

74.12.23 MATHEMATICS

MATH 101. *Trigonometry.* ★0 (First Term, 2-0-0). This course consists of the trigonometry material contained in MATH 100 and is offered in the Winter Session. Prerequisite: Mathematics 20 or equivalent. Note: This course cannot be taken for credit towards a degree.

MATH 202. *Elementary Calculus I.* ★3 (First Term, 3-0-1). Review of analytic geometry, differentation and integration of simple functions, applications. Prerequisite: Mathematics 30 or equivalent. Note: Prerequisite: Those students who have no knowledge of trigonometry are required to take MATH 101 concurrently. This course may not be taken for credit if credit has already been obtained in any of MATH 203, 207, 212, or 245.

MATH 203. *Elementary Calculus I.* ★3 (either term, 3-0-0). This course description is the same as for MATH 202. Prerequisite: Mathematics 30, Mathematics 31, (calculus sequence), or equivalent. Students with low grades in high school calculus should take MATH 202. Note: This course may not be taken for credit if credit has been obtained already in any of MATH 202, 207, 212 or 245.

MATH 204. *Elementary Calculus II.* ★3 (either term, 3-0-0). Differentiation and integration of trigonometric, exponential and logarithmic functions. Indeterminate forms and improper integrals. Techniques of integration. Applications. Prerequisite: MATH 202 or 203, or 245 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 208 or 213.

MATH 221. *Linear Algebra I.* ★3 (either term, 3-0-0). Solving linear equations, matrix algebra, determinants, n-space, linear programming. Prerequisite: Mathematics 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 243, 274, 278, 281 or 312.

MATH 222. *Linear Algebra II.* ★3 (either term, 3-0-0). Bases, linear transformations, change of bases, eigenvectors, Markov processes. Prerequisite: MATH 221, 278 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 378 or MATH 381.

MATH 261. *Foundations of Mathematics I.* ★3 (either term, 3-0-0). Axiomatic treatment of mathematical systems. Groups, rings and fields. Elementary logic and methods of proof. Prerequisite: Mathematics 30. This course is primarily for students of Elementary Education who have not chosen mathematics as an area of concentration. It may not be taken for credit by Arts and Science students.

MATH 262. *Foundations of Mathematics II.* ★3 (either term, 3-0-0). Introduction to set theory. Cartesian products, relations, and functions. Applications to elementary algebra, combinatories, and topology. Classical and modern views of geometry with applications. Prerequisite: MATH 261.

74.12.24 MOVEMENT EDUCATION

MOV 201. *Introduction to the Movement Activities of Children Aged 0-8.* ★3 (either term, 0-6L-0). A study of play and other movement activities including games, gymnastics and dance for children.

MOV 202. *Introduction to the Movement Activities of Children Aged 8-12.* ★3 (either term, 0-6L-0). A study of games, gymnastics, dance and other movement activities for children.

MOV 244. *Introduction to the Movement Activities of Youth, Part I* ★3 (First Term, 0-3L-0). A study of a wide range of physical activities and the related underlying concepts.

MOV 245. *Introduction to the Movement Activities of Youth, Part II* ★3 (Second Term, 0-3L-0). A continued study of physical activities and the related underlying concepts. Prerequisite: MOV 244.

MOV 301. *Motor Development and Motor Learning.* ★3 (either term, 3-0-0). Lecture course focusing on important relationships between human physical growth and development, and environmental factors that influence the acquisition of motor skills.

MOV 321. *Structure and Strategy of Games.* ★3 (First Term, 0-3L-0). A study of games, their classification with regard to skills, rules and strategies through practical and theoretical experiences.

MOV 325. *Introduction to the Scientific Basis of Human Movement.* ★3 (either term, 3-0-0). Lecture course with emphasis on introductory knowledge and practical implications of the structural and functional characteristics and capacities of the human body with respect to movement.

MOV 327. *Creative Dance.* ★3 (either term, 0-3L-0). A study of the application of Laban's principles of movement in dance. The individual's understanding of these principles is extended through personal performance.

MOV 351. *Educational Gymnastics.* ★3 (either term, 0-3L-0). Gymnastics themes are studied and used to develop efficient movement through practical work in individual work in individual and group situations.

Curriculum and Instruction Courses see § 74.6.

74.12.25 MUSIC

MUSIC 200. *Rudiments of Music.* ★3 (either term, 3-0-0). Fundamentals of music theory approached through aural and written training.

MUSIC 206. *Introduction to Music I.* ★3 (First Term, 3-0-0). Definition of terms; forms and styles in music from Baroque through Classical periods. Listening and recorded examples. Note: Open to all students not eligible for MUSIC 202, 203, 301, 304 or 402.

MUSIC 207. *Introduction to Music II.* ★3 (Second Term, 3-0-0). The Romantic period to the present. Familiarity with the concert repertoire. Note: Open to all students not eligible for MUSIC 202, 203, 301, or 402.

MUSIC 209. *Woodwind Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on clarinet. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not offer 209 for credit.

MUSIC 210. *Foundations of Music.* ★6 (0-5L-0). The development of a musical repertoire and knowledge of basic content appropriate for teachers. Note: Limited to students in the Faculty of Education, not eligible for admission to MUSIC 301 and 304.

MUSIC 216. *Brass Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on trumpet. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not offer 216 for credit.

MUSIC 218. *String Techniques I.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on violin and viola. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not offer 218 for credit.

MUSIC 220. *Percussion Techniques.* ★3 (First Term, 3-0-0). Practical and theoretical instruction on percussion instruments. Prerequisite: Ability to read music. Note: Students with credit in MUSIC 311 may not offer 220 for credit.

MUSIC 250. *Elementary Harmony.* ★3 (0-3L-0). Diatonic harmony, including secondary sevenths. Modulation. Use of unessential notes of all kinds. Harmonizing of chorales in the style of Bach. Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement and Aural Skills Examinations for other than B.Mus. students. Note: A single-term course offered over the full session. Note: Formerly a full-session course.

MUSIC 251. *Elementary Aural Skills.* ★3 (0-3L-0). The aural perception of materials covered in MUSIC 250. Prerequisite: MUSIC 200 or satisfactory completion of the Department of Music Theory Placement and Aural Skills Examinations for other than B.Mus. students. Note: A single-term course offered over the full-session. Note: Formerly part of MUSIC 250.

THE ABILITY TO READ MUSIC IS REQUIRED FOR ALL COURSES LISTED BELOW.

MUSIC 310. *Woodwind Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction on woodwind instruments. Note: Students with credit in MUSIC 311 may not offer 310 for credit. Prerequisite: MUSIC 209 or proficiency examination.

MUSIC 311. *Instrumental Techniques.* ★6 (0-6L-0). Practical and theoretical instruction on the instruments of the band and orchestra. Note: Students with credit in one or more of MUSIC 209, 216, 218, 220, 310, 317, 319 may not offer MUSIC 311 for credit.

MUSIC 317. *Brass Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction on brass instruments. Prerequisite: MUSIC 216 or proficiency examination. Note: Students with credit in MUSIC 311 may not offer 317 for credit.

MUSIC 319. *String Techniques II.* ★3 (Second Term, 3-0-0). Practical and theoretical instruction on cello and string bass. Prerequisite: MUSIC 218 or proficiency examination. Note: Students with credit in MUSIC 311 may not offer 319 for credit.

74.12.26 PHYSICAL EDUCATION

The following courses are open to Education students:

DANCE 270. *Introduction to Modern Dance.* ★3 (either term, 3-0-0).

DANCE 275. *Dance Forms.* ★3 (either term, 3-0-0).

P ED 211. *Introduction to Basketball.* ★3 (either term, 3-0-0).

P ED 212. *Introduction to Field Hockey.* ★3 (either term, 3-0-0).

P ED 213. *Introduction to Football.* ★3 (First Term, 3-0-0).

P ED 214. *Introduction to Ice Hockey.* ★3 (either term, 3-0-0).

P ED 215. *Introduction to Soccer.* ★3 (First Term, 3-0-0).

P ED 216. *Introduction to Volleyball.* ★3 (either term, 3-0-0).

P ED 224. *Introduction to Wrestling.* ★3 (either term, 3-0-0).

P ED 225. *Introduction to Gymnastics.* ★3 (either term, 3-0-0).

P ED 227. *Introduction to Aquatics.* ★3 (either term, 3-0-0).

P ED 228. *Introduction to Track and Field I.* ★3 (First Term, 3-0-0).

P ED 229. *Introduction to Track and Field II.* ★3 (Second Term, 3-0-0).

74.12.27 PHYSICS

PH SC 341. *Physical Science.* ★6 (3-0-0). A course designed to give non-science students some appreciation of fundamental ideas and methods in the physical sciences, their history and development, modern trends in these fields, and their relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy, and Geology.

PHYS 203. *Introductory General Physics I (Mechanics).* ★ (First Term, 4-1s-3). A non calculus course in physics for students without Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles

oscillations. Prerequisite: Mathematics 30. The course is intended to be taken in sequence with PHYS 207 and/or 209. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 205. *Introductory General Physics I. (Mechanics).* ★3 (First Term, 3-0-3). Course contents same as PHYS 203 but designed for students who have taken Physics 30. Prerequisite: Mathematics 30, Physics 30. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 207. *Introductory General Physics II (Matter, Sound, Heat and Optics).* ★3 (Second Term, 3-0-3/2). Properties of gases, liquids and solids, wave motion and sound, heat, and thermodynamics, geometrical and physical optics. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 207 and 212.

PHYS 209. *Introductory General Physics III (Electricity, Magnetism and Atoms).* ★3 (Second Term, 3-0-3/2). The nature of electricity and magnetism, AC currents, electromagnetic waves, atomic and nuclear structure. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 209 and 212.

PHYS 212. *Basic General Physics.* ★6 (3-0-3). Physics 212 utilizes some calculus. Topics include mechanical, thermal, electromagnetic and optical properties of matter; the forms and transformations of energy; introduction to the atomic theories of modern physics. Prerequisites: Physics 30; Mathematics 30. Corequisites: MATH 202, 204. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 242. *Mechanics, Electricity and Magnetism.* ★6 (3-1s-3). Kinematics; particle dynamics; work and energy; linear momentum; gravitation; oscillations; charge; electric field; Gauss's law; electric potential; capacitance; currents and resistance; EMF and DC circuits; magnetic field; Ampere's law; Faraday's law; inductance. Prerequisites: Physics 30, Mathematics 30. Corequisite: MATH 202(203)/204.

PHYS 269. *The Physics of Music and High-Fidelity.* ★3 (Second Term, 3-0-0). Waves and sound, complex waves and musical instruments, the nature of music, decibels, loudspeakers, electricity and amplifiers, heat production, electromagnetic waves and tuners, electromagnetism and cartridges, records and tape decks. Note: Credit may be obtained in only one of PHYS 269 or 369.

PHYS 301. *Quantum Aspects of Modern Physics.* ★3 (First Term, 3-0-3/2). Experimental evidence leading to the development of quantum mechanics including the photo-electric effect, the Compton effect, Xray production and electron diffraction. A discussion of the Heisenberg uncertainty principle and the Schrodinger theory of quantum mechanics including applications of one dimensional potential wells and barriers, tunnelling, the simple harmonic oscillator. Prerequisite: First year physics course(s) (two-term); MATH 204.

PHYS 303. *Relativistic Aspects of Modern Physics.* ★3 (Second Term, 3-0-0). Topics included are limitations of classical physics; Einstein's special theory; length contraction; time dilation; twin paradox; equivalance of mass and energy; relativistic mass and momentum. The General Theory of Relativity including deflection of light, black holes, models of the universe and curvature of space. Prerequisite: First year physics course(s) (two-term).

PHYS 304. *Revolutions in Physics.* ★6 (3-0-0). Discussion of the way scientists were forced to change their concepts that caused the major revolutions in physics and the accompanying reverberations in the non-scientific world. Illustrations from celestial motion, Newtonian synthesis, theory of relativity, the probabilistic nature of quantum mechanics. Prerequisite: First year physics course(s) (two-term).

PHYS 313. *Thermal Physics with Biological Applications.* ★3 (First Term, 3-0-0). Applications of elementary probability to biopolymers, solute flow and diffusion across membranes. Thermal equilibrium. Ideal gas. Simple crystals. Entropy and the Second Law of Thermodynamics. Free energies. Applications to solutions of organic molecules in simple liquids, DNA replication and oxygen in haemoglobin. Prerequisite: First year physics course(s) (two-term); MATH 204.

PHYS 342. *Contemporary Physics.* ★6 (3-0-0). A largely non-mathematical course aimed at providing non-science students with a basic framework of fundamental laws upon which the technology of modern life is based. Currently important topics such as conventional and nuclear energy production, resources and hazards will be discussed. Modern technological applications (e.g., lasers, computers, satellites, communication, transistors) are included. Additional topics will depend on student interest.

PHYS 361. *Physics of the Energy Question.* ★3 (First Term, 3-0-0). Energy in its various forms. Energy conversion. Nuclear fission and fusion. Nuclear power, its advantages and limitations. Heat engines, refrigerators and their efficiencies. Electric power generation. Earth's energy balance, thermal pollution. Growth of the world's population and energy consumption. Energy sources, transient and continuous (solar energy). Technology of energy use. Energy conservation and the economics of energy use. Prerequisite: First year physics course(s) (two-term).

PHYS 363. *Applications of Physics to Environmental Problems.* ★3 (Second Term, 3-0-0). Radiation and climate. Body heat balance and energy exchange. Space heating. Interaction of radiation with matter. Environmental and human health impacts of power production. Noise. Air pollution. Transportation, the automobile and mass transportation. Technology and applications of solar energy. Prerequisite: First year physics course(s) (two-term).

PHYS 369. *Physical Aspects of Music and High Fidelity.* ★3 (Second Term, 3-0-3). A lecture and lab course designed to illustrate the concepts of waves, sound, electricity and magnetism as applied to musical instruments, amplifiers, tuners, records and tape decks. Note: Credit may be obtained in only one of PHYS 369 or 269.

PHYS 401. *Nuclear Physics and Elementary Particles.* ★3 (Second Term, 3-0-3/2). Topics include the properties and structure of the nucleus; radioactivity, carbon dating, tracer techniques; nuclear fission; fusion; nuclear reactors; elementary particles and particle accelerators. Prerequisite: PHYS 301.

PHYS 403. *Atomic, Molecular and Solid State Physics.* ★3 (Second Term, 3-0-3/2). Topics in atomic physics: Thomson's and Rutherford's model of the atom, experimental aspects of atomic spectra, the Bohr model, atomic structure based on the Schrodinger wave equation, electron spin, the Pauli exclusion principle and characteristic Xray spectra. Topics in molecular physics: a discussion of bonding in molecules and the basis for understanding molecular structure from both the experimental and theoretical points of view. Topics in solid state physics: elementary statistical mechanics, properties of metals, insulators, semi-conductors; specific heat and magnetic properties of solids; superconductivity. Prerequisite: PHYS 301.

74.12.28 PLANT SCIENCE

PL SC 215. *Introductory Plant Science.* ★3 (Second Term, 3-0-0). Climatic, soil and biological factors in relation to growth of native and crop plants. Their regional adaptability, distribution and production. Principles of crop protection and management.

INT D 230. *Practical Plant Biology.* ★3 (First Term, 3-0-3). The practical aspects of plant structure and classification. Laboratory exercises will emphasize crop plants. Prerequisite: Biology 30 or BIOL 130. (Offered jointly by the Department of Botany and Plant Science.) [Plant Science.]

74.12.29 POLITICAL SCIENCE

POL S 201. *Introduction to Government.* ★3 (either term, 3-0-0). An introduction to the institutions of Canadian and other democratic governments, considering constitutions, legislatures, executives, the public service, courts, federal and other divisions of government authority and other selected topics. Formerly part of POL S 200

POL S 202. *Introduction to Politics.* ★3 (either term, 3-0-0). An introduction to the process of democratic politics considering power, or influence, democracy, civil liberties, and rights, political ideology, public opinion, elections, political parties, interest groups and other selected topics. Note: Formerly part of POL S 200.

74.12.30 RELIGIOUS STUDIES

RELIG 200. *Introduction to the Study of Religion.* ★6 (3-0-0). The origin and development of the history of religions as a separate academic discipline. Principles and methods of this discipline. Some account of the major living religions in their history and distinctive features.

74.12.31 ROMANCE LINGUISTICS

R LIN 372. *French Phonetics.* ★3 (either term, 3-0-0). An introduction to French phonetics focusing on the recognition and elimination of pronunciation difficulties for English speakers. Francophone students require permission to take this course. Note: Not open for credit to students having credit or registered in Faculté Saint-Jean LIN R 320.

74.12.32 RUSSIAN

RUSS 100. *Beginners' Russian* (Arts Section). ★6 (3-0-2). Essentials of grammar, reading, and drill on useful expressions. Designed to give a working knowledge of the Russian language.

74.12.33 SOCIOLOGY

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society is analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third year or more advanced students are encouraged to take SOC 403 rather than 202.

74.12.34 SOIL SCIENCE

SOILS 302. *Principles of Soil Science.* ★3 (First Term, 3-0-0). An introduction to soil components and their properties. Concepts of soil dynamics in different ecological systems. Formations and classification of major soil groups of Canada and the world. A review of world soil resources. Primarily designed for students in faculties other than Agriculture and Forestry.

74.12.35 UKRAINIAN

UKR 200. *First Year University Ukrainian.* ★6 (3-0-1). A brief review of phonology, an intensive study of grammar. Readings of selected texts from modern Ukrainian literature, and elementary composition supplemented by laboratory work in conversational Ukrainian. Designed for students having some previous knowledge of Ukrainian. Prererquisite: Ukrainian 30 or the consent of the Department.

Faculty of Engineering

81 INTRODUCTORY

81.1 Members of the Faculty

81.1.1 OFFICERS OF THE FACULTY

Professor and Dean
P. F. G. ADAMS, Ph.D., P.Eng.

Associate Deans
T. M. HRUDEY, Ph.D., P.Eng.
C. E. CAPJACK, Ph.D., P.Eng.

81.1.2 DEPARTMENT OF CHEMICAL ENGINEERING

Professor and Chairman
F. D. OTTO, Ph.D., P.Eng.

Professors
I. G. DALLA LANA, Ph.D., P.Eng.
D. G. FISHER, Ph.D., P.Eng.
J. H. MASLIYAH, Ph.D., P.Eng.
A. E. MATHER, Ph.D.
W. NADER, Dr. Phil.
D. B. ROBINSON, Ph.D., P.Eng.
J. T. RYAN, Ph.D.
S. E. WANKE, Ph.D., P. Eng.
R. K. WOOD, Ph.D.

Associate Professors
C. KIPARISSIDES, Ph.D.
S. L. SHAH, Ph.D.

Assistant Professor
D. T. LYNCH, B.Sc.

81.1.3 DEPARTMENT OF CIVIL ENGINEERING

Professor and Chairman
J. P. VERSCHUREN, Ph.D., P.Eng.

Professors
P. F. G. ADAMS, Ph.D., P.Eng.
K. O. ANDERSON, M.Sc., P.Eng.
I. J. BAKKER, M.S.C.E., P.Eng.
R. BJORHOVDE, Dr. Ing., Ph.D., P.Eng.
P. H. BOUTHILLIER, S. M., P.Eng.
D. M. CRUDEN, Ph.D., P. Geol.,
(Joint Appointment with Geology)
E. EISENSTEIN, Ph.D., P.Eng.
E. L. FOWLER, M.Sc., P.Eng.
I. GERARD, Ph.D., P.Eng.
T. M. HRUDEY, Ph.D., P.Eng.
B. L. KULAK, Ph.D., P.Eng.
. LONGWORTH, M.Sc., P.Eng.
. G. MacGREGOR, Ph.D., P.Eng.
. R. MORGENSTERN, Ph.D., P.Eng., F.R.S.C.
. W. MURRAY, Ph.D., P.Eng.
. W. PETERSON, M.Sc., P.Eng.
. RAJARATNAM, Ph.D., P.Eng.
. D. SCOTT, Ph.D., P. Eng., (AOSTRA Professor)
. H. SIMMONDS, Ph.D., P.Eng.
. W. SMITH, Ph.D., P. Eng., P.E.
. TEPLY, Dip. Ing., P.Eng.
. THOMSON, Ph.D., P.Eng.
WARWARUK, Ph.D., P.Eng.

Associate Professors
S. E. HRUDEY, Ph.D., P.Eng.
P. K. KAISER, Ph.D., P. Eng.
C. J. MONTGOMERY, Ph.D., P.Eng.
D. C. SEGO, Ph.D., P. Eng.
G. T. WORMSBECKER, B.Sc., P.Eng.

81.1.4 DEPARTMENT OF ELECTRICAL ENGINEERING

Professor and Chairman
C. R. JAMES, Ph.D., P.Eng.

University Professor
G. B. WALKER, Ph.D., P.Eng.

Professors
K. E. BOLLINGER, M.Sc., (Electric Utilities Professor of Power Engineering)
C. E. CAPJACK, Ph.D., P.Eng.
G. S. CHRISTENSEN, Ph.D., P.Eng.
F. S. CHUTE, Ph.D., P.Eng.
P. A. GOUD, Ph.D., P.Eng.
V. GOURISHANKAR, Ph.D., P.Eng.
P. J. R. HARDING, M.A.Sc., P.Eng.
D. H. KELLY, Ph.D., P.Eng.
Y. J. KINGMA, Ir., P.Eng.
R. P. W. LAWSON, Ph.D., P. Eng.
A. A. OFFENBERGER, Ph.D.
R. E. RINK, Ph.D., P.Eng.
A. M. ROBINSON, Ph.D.
H. G. SCHMIDT-WEINMAR, Ph.D.
H. J. J. SEGUIN, Ph.D.
P. R. SMY, Ph.D., D.Sc., P.Eng.
K. A. STROMSMOE, Ph.D., P.Eng.
J. TULIP, Ph.D.
F. E. VERMEULEN, Ph.D., P.Eng.
W. A. G. VOSS, Ph.D., P.Eng., C.Eng.

Associate Professors
C. G. ENGLEFIELD, Ph.D.
R. W. KING, B.Sc., P.Eng.
D. O. KOVAL, Ph.D.
D. ROUTLEDGE, Ph.D., P.Eng.
W. R. TINGA, Ph.D., P.Eng.
J. F. VANELDIK, Ph.D., P.Eng.

81.1.5 DEPARTMENT OF MECHANICAL ENGINEERING

Professor and Chairman
D. G. BELLOW, Ph.D., P.Eng.

Professors
K. C. CHENG, Ph.D.
J. R. COLBOURNE, Ph.D., P.Eng.
A. CRAGGS, Ph.D., P.Eng.
J. D. DALE, Ph.D., P. Eng.
M. G. FAULKNER, Ph.D., P.Eng.
G. FORD, Ph.D., P.Eng
R. R. GILPIN, Ph.D., P.Eng.
J. B. HADDOW, Ph.D.
J. S. KENNEDY, Ph.D., P.Eng.
G. S. H. LOCK, Ph.D., P.Eng.
D. J. MARSDEN, Ph.D., P.Eng.
C. M. RODKIEWICZ, Ph.D., P.Eng.
G. W. SADLER, M.Sc., P.Eng.

J. C. SPRAGUE, Ph.D., P.Eng.
D. J. WILSON, Ph.D., P.Eng.

Associate Professors
D. R. BUDNEY, Ph.D., P. Eng.
T. W. FOREST, Ph.D., P.Eng.
E. M. GATES, Ph.D.
A. MIODUCHOWSKI, Ph.D., P.Eng.
J. D. WHITTAKER, Ph.D., P.Eng.

81.1.6 DEPARTMENT OF MINERAL ENGINEERING

Professor and Chairman
D. L. FLOCK, Ph.D., P. Eng.

Professors
N. BERKOWITZ, Ph.D., P.Eng.
S. A. BRADFORD, Ph.D., P.Eng.
P. M. DRANCHUK, M.Sc., P.Eng.
S. M. FAROUQ ALI, Ph.D., P. Eng.
T. S. GOLOSINSKI, Ph.D., P. Eng.
M. JEREMIC, Dr. Ing. P.Eng., P. Geol.
B. M. PATCHETT, Ph.D., P.Eng.
(NOVA Professor of Welding Engineering)
L. R. PLITT, M.Sc., P.Eng.
F. H. VITOVEC, Dr. Tech. Sci., P. Eng.
M. L. WAYMAN, Ph.D.

Associate Professors
R. G. BENTSEN, Ph.D.
M. B. DUSSEAULT, Ph.D., P.Eng. (AOSTRA Professor)
T. H. ETSELL, Ph.D.
B. STIMPSON, Ph.D., P.Eng.

Assistant Professor
B C. FLINTOFF, M.Sc.

81.1.7 SESSIONAL LECTURER IN ENGINEERING

B. R. TOUCHINGS, LL.B.

81.1.8 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Professors
A. Z. CAPRI, Ph.D. (Physics)
W. A. DAVIS, Ph.D. (Computing Science)
K. W. DOMIER, Ph.D., P.Eng. (Agricultural Engineering) (Alternate)
L. H. ERBE, Ph.D. (Mathematics) (Alternate)
B. T. STEPHANSON, M.Sc., P.Eng. (Agricultural Engineering)
J. TARTAR, Ph.D. (Computing Science) (Alternate)
J. TIMOURIAN, Ph.D. (Mathematics)

Associate Professors
D. W. GILLEN, Ph.D., (Economics)
J. S. MARTIN, Ph.D. (Chemistry)
R. W. MAY, Ph.D., P. Geol. (Geology)

Assistant Professor
B. J. MITCHELL, Ph.D. (English)

Representatives
(The Association of Professional Engineers, Geologists and Geophysicists of Alberta)
W. R. CHERITON, B.E., B.A.Sc., P.Eng. (Alternate)
H. L. MORRISON, B.Sc., P.Eng.

Representatives from Engineering Students
D. L. COUTTS
J. A. LEGGE
R. K. MacDOUGALL

Registrar of the University
W. A. BLANCHARD, Ph.D.

81.1.9 STUDENT WORK EXPERIENCE PROGRAM

Director
P. G. KUSHNIR

82 FACULTY REGULATIONS

82.1 Admission and Registration

The general admission requirements, application procedure, registration procedure and fee schedule are set out in § § 13, 14 and 15 of the University Regulations and Information for Students Calendar. Students wishing to enter the Faculty of Engineering with advance standing including students returning to the faculty, must submit their application and all documents by June 15.

Upon notification of acceptance, successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

Specific regulations pertaining to the admission of students to the Faculty of Engineering are included here for both Canadian and foreign students. Students who completed the bulk of their final year of high school two or more years prior to making application for admission are required to consult with the Dean and the Student Counselling Services by June 30.

The admission requirements are:

1. *Applicants from Alberta High Schools*

Applicants for admission from the high schools of Alberta must normally possess a High School Diploma, a minimum grade of at least 50% and an overall average of at least 60% in the following subjects: English 30, Mathematics 30, Physics 30, Chemistry 30 and one other matriculation subject (preferably Mathematics 31).

A student lacking either Physics 30 or Chemistry 30 may be considered for admission at the discretion of the Dean. In such cases program adjustments may be necessary.

2. *Applicants from other Provinces and Territories of Canada*

A student from another province who has clear senior matriculation and would be acceptable in a similar program in that province may be considered for admission at The University of Alberta.

3. *Applicants from outside Canada*

Admission requirements for students presenting other than Canadian admission qualifications are outlined in § 13.23 of the University Regulations.

Applications for admission from non-Canadian students must be received, fully completed, by the Office of the Registrar not later than June 1, 1981.

4. *English Language Proficiency*

In addition to the English requirements included above and regardless of country of origin or citizenship status, applicants will be required to demonstrate

proficiency in the English language as a prerequisite to admission as indicated in § 14.3 of the University Regulations and Information for Students Calendar.

Since students in the Faculty of Engineering are required to carry a full course load [see regulation 82.3.3(b)], applicants presenting a TOEFL score as proof of proficiency will not be admitted if the score is less than 600.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

Additional information may be obtained at the Office of the Dean of Engineering, 5th floor, Mechanical Engineering Building. Prospective students who have been away from their studies for some time or have special problems should make an appointment to see the Associate Dean (Student Affairs and Records) prior to June 30. This appointment can be made by mail or by telephone (432-3399).

82.2 Residence Requirements

A student proceeding towards a B.Sc. degree in engineering must normally attend at least the equivalent of two academic years in the Faculty of Engineering and complete four full terms of approved course work comprising a minimum of 72 units of credit. This should comprise the last four terms of the student's program.

Where a student has been accepted as a transfer student from another accredited engineering program at a Canadian university and has the equivalent of six full terms of transfer credit, consideration may be given to reducing the residence requirement to one academic year consisting of two full terms.

82.3 Academic Regulations

1. *Quotas*

Student quotas exist for initial entry to the Faculty of Engineering and again at the second year level to a specialized program.

Entry to a specialized program is based upon the student's academic performance in the first, or qualifying, year. All students in a first or qualifying year and new applicants to the faculty with sufficient advance credit to be considered for the second year quota must submit a "SECOND YEAR ENGINEERING BRANCH SELECTION FORM" by June 15.

A student entering the Faculty directly from high school must normally qualify for a specialized program in not more than four terms (two years); others in not more than two terms (one year). Failure to do so will result in the student being required to withdraw.

2. *Requirements to Graduate*

Pass in all courses as required by the specific program in accordance with the rules and regulations of the Faculty of Engineering and the University.

3. *Course Load*

(a) The normal course loads for each term are outlined in the appropriate section of the calendar under "Programs of Study" (§ 83). A student at his/her own request, or upon the advice of a counsellor, may extend the course load of terms three to eight over a total of eight terms. Students wishing to do so should consult with their departmental advisor at the start of the third term.

(b) Students in their qualifying year for a specialized program may not normally take a course load of less than 20 units per term.

(c) Other students may not normally take a course load of less than 15 units per term.

(d) A student may not take more than a normal load except with Faculty permission. A student on probation *must not* take a course load in excess of a normal load.

4. *Promotion to Next Term*

At the end of each term, a student's progress will be evaluated as follows:

(a) *Pass* — term G.P.A. not less than 4.5. Proceed to next term, repeating any failed course(s).

(b) *Conditional* — term G.P.A. less than 4.5 but not less than 4.0. Proceed to next term on probation repeating any failed course(s) except if already on probation or has been twice before, in which case student must withdraw. The only exceptions are: (i) if the student is in "First Term" (§ 83.2) of the program he/she may proceed to the next term without penalty, repeating any failed course(s); (ii) if the student is in the final term of the program, in which case credit is withheld for grades of 4. One more term is allowed in which the student must complete the degree requirements and obtain a G.P.A. not less than 4.5. Failure to do so will result in the student being required to withdraw.

(c) *Fail* — term G.P.A. less than 4.0. Required to withdraw except if in "First Term" of program student may repeat the term once without penalty, receiving credit for those courses completed with a grade of 5 or better.

The term G.P.A. will be the weighted average for all courses taken in that term. A full year course will be included in the second term G.P.A. using its full session unit value. Where a course grade is AB-F or WF then the term G.P.A. will be calculated using a numerical value of 1 for such grades.

5. *Deficiencies From a Previous Term*

Where a student is deficient credit in a course (or courses) from a previous term either through failure or otherwise, that student must normally clear that deficiency the next time the course (or courses) is (are) offered.

Where the deficiency is the result of failure or withdrawal from an elective course, another course may be substituted provided that Faculty approval is first received to do so.

6. *Re-enrolment After Being Required to Withdraw*

A student who is required to withdraw may make application for re-enrolment for the same term the following year, receiving credit for those courses completed with a grade of 5 or better.

A student who is required to withdraw a second time will not normally be re-admitted to the Faculty of Engineering.

7. *Passing Grade*

A grade of 4 or better is normally a passing grade. A grade of 3 may be accepted if:

(i) it is attained in a course given by an engineering department, and

(ii) it is the only grade of 3 or less in that term, and

(iii) the course load is 15 units or more, and

(iv) the term G.P.A. is 5.5 or greater.

8. *Withdrawal From Courses*

Where permitted, a student wishing to drop a course or change from "credit" to "audit" must do so prior to the following dates: First term courses, November 12; Second term courses, March 1. A withdrawal after these dates will be assumed to be due to imminent failure in the course(s) and a grade of WF will be assigned.

A student's course load may not be reduced below the limits given in 3. *Course Load.*

9. *Supplemental Examinations*

Supplemental examination privileges will not be granted except in the three specific cases outlined in (a), (b) and (c) below. In these specific cases, supplemental privileges may be granted following application to the Dean's Office.

(a) If the student is in good standing and is otherwise eligible for graduation, he or she may be granted supplemental privileges in one course only in the penultimate term. In this case the supplemental examination is to be written no later than the end of Second Term Reading Week.

(b) If a student has passed the supplemental examination under clause (a) above, is in good standing and is otherwise eligible for graduation, he or she may be granted supplemental privileges in one course only in the next term if it is the final term.

(c) If a student has not written a supplemental examination under clause (a) above, is in good standing and is otherwise eligible for graduation, he or she may be granted supplemental privileges in two courses only in the final term.

10. *Part-Time Students*

A student unable, for acceptable reasons, to carry the course load required in 3. *Course Load*, may enrol as a part-time student.

Credit may be granted toward a degree for a grade of 5 or better, withheld for a grade of 4 and failure assigned for a grade of 3 or less.

Such a student may not totally complete the degree requirements on a part-time basis but must meet the normal Faculty residence requirements (see § 82.2).

11. *Academic Awards and Recognition*

(a) Unless otherwise specified, consideration for an academic award or recognition is normally based upon the work of an academic session (two terms), in which the student must have completed at least a total of 36 units of credit.

(b) For purposes of determining the eligibility of a student to be considered for a particular award when completion of, or entry to a year is specified, the following guidelines will normally be used:

Year completed (entering)	*Minimum units* completed
1st (2nd)	36
2nd (3rd)	72
3rd (4th)	108
4th	Degree awarded

12. *Appeal of Academic Decisions*

A student may appeal an academic decision (but no a specific grade) of a senior administrative officer t the Faculty Academic Appeals Committee. To do s he / she must make his / her decision known to the Dea within 10 days of the date of the decision. An unsuc cessful appeal within the Faculty may be carried to th General Faculties Council Academic Appeals Commit tee. See § 16.7 University Regulations and Informatio for Students Calendar.

82.4 *Professional Associations and Technical Societies*

The practice of Engineering throughout Canada i regulated by Professional Associations in each prov ince. The right to practice and accept professional re sponsibility is limited to those who are registered wit the professional organization in the particular provinc concerned. In Alberta this is The Association of Profes sional Engineers, Geologists and Geophysicists o Alberta. Members of the Engineering Students' Societ are automatically student members of the Associatio Graduates are encouraged to join the Association a Engineers in Training. Two years of acceptable exper ence following graduation is necessary and sufficie for registration as a Professional Engineer.

The practicing engineer keeps abreast of technolo ical developments through membership in one of se eral technical societies. Student Branches of these s cieties (C.S.A.E.; C.S.Ch.E.; C.S.C.E.; I.E.E.E C.S.M.E.; C.I.M.) have active chapters on campu Engineering students are encouraged to join the so ety closest to their speciality.

82.5 *Registration in Engineering Courses by Students in Other Faculties*

Although the Faculty of Engineering is a restricte enrolment Faculty, it is possible for students who a registered in other Faculties to enrol in a limited nu ber of engineering courses.

However, students who are not registered in th Faculty of Engineering *must* obtain permission to enr in engineering courses. The appropriate Departme Chairman in the Faculty of Engineering is authorized grant permission.

NOTE: This requirement does *not* apply to studen who are in programs (e.g. Agricultural Engineerin which include engineering courses as a formal part the program.

83 PROGRAMS OF STUDY

A degree of B.Sc. in Engineering is offered and is described in Section 83.1. A four-year program in Agricultural Engineering is offered cooperatively by the Faculty of Agriculture and Forestry and the Faculty of Engineering. For details of the program see Section 83.8 of the Faculty of Engineering Calendar.

83.1 The Degree of B.Sc. in Engineering

83.1.1 GENERAL INFORMATION

The program for the degree of B.Sc. in Engineering begins with two terms in which the courses are common to all students.

In subsequent terms some of the courses are common to all students and many options are available to give the student an introduction to a specialized field of Engineering. In the final terms each department suggests one or more specialized patterns although each student has freedom in the choice of electives.

Students, with the consent of the Faculty or departmental advisors, may make substitutions in a recommended course pattern; however, each department will require certain courses, prerequisites and corequisites before registration can be approved.

The Faculty of Engineering recognizes the need for exposure of all engineering students to certain fundamental engineering, science, human relations, public relations and communications courses. Therefore the following courses must be taken by all students within the Faculty of Engineering.

	No. of Units
1. CHEM 203 (Introductory University Chemistry I)	4.3
2. CHEM 205 (Introductory University Chemistry II)	3.8
3. A single-term course in Economics (Note A)	3.0
4. ENGG 200 (Orientation to the Engineering Profession)	2.0
5. ENGG 210 (Engineering Graphics)	3.5
6. ENGG 230 (Engineering Statics I)	4.0
7. ENGG 231 (Engineering Statics II)	3.0
8. ENGG 500 (The Practice of the Engineering Profession)	1.0
9. MATH 212 (Calculus I)	4.0
10. MATH 213 (Calculus II)	5.0
11. MATH 312 (Linear Algebra and Infinite Series)	3.0
12. MATH 313 (or equivalent) (Differential Equations IA)	4.0
13. MATH 315 (Calculus III)	3.0
14. PHYS 231 (Mechanics)	3.8
15. PHYS 235 (Electricity and Magnetism)	3.8
16. A total of four single-term courses in the humanities and social sciences, *two* of which must be from the approved list provided at time of registration.	
17. At least one 3-unit course in each of at least three of the following five areas:	
(i) Strength of Materials	
(ii) Thermodynamics	
(iii) Materials Science	
(iv) Fundamental Electrical Engineering	
(v) Engineering Mechanics (Dynamics)	

NOTE A: Any Economics course taught within the Faculty, or in the Faculties of Arts or Business Administration and Commerce, will meet the requirement for Economics.

NOTE B: Pass-Fail courses will not be accepted for credit unless specifically approved by the Dean.

83.2 Recommended Program (All Engineering Students)

First Term

	Hours	*Units*
CHEM 203 (Introductory University Chemistry I)	3-1s-3/2	4.3
ENGG 200 (Orientation to the Engineering Profession)	2-0-0	2.0
ENGG 210 (Engineering Graphics)	2-0-3	3.5
or		
Elective (Note A)	3-0-0	3.0
ENGG 230 (Engineering Statics I)	3-0-2	4.0
MATH 212 (Calculus I)	3-0-2	4.0
PHYS 231 (Geometrical Optics and Mechanics)	3-0-3/2	3.8
		Total 21.1 or 21.6

Second Term

	Hours	*Units*
CHEM 205 (Introductory University Chemistry II)	3-0-3/2	3.8
ENGG 210 (Engineering Graphics)	2-0-3	3.5
or		
Elective (Note A)	3-0-0	3.0
ENGG 231 (Engineering Statics II)	2-0-2	3.0
MATH 213 (Calculus II)	4-0-2	5.0
PHYS 235 (Electricity and Magnetism)	3-0-3/2	3.8
Elective (Note A)	3-0-0	3.0
		Total 21.6 or 22.1

NOTE A: The elective shall be from the list referred to in item 16 under § 83.1.1.

NOTE B: Approximately one-half of the first year engineering students will take ENGG 210 in the First Term and the other half will take it in the Second Term.

83.3 Third to Eighth Terms— Chemical Engineering

83.3.1 GENERAL INFORMATION

The B.Sc. program in Chemical Engineering provides a technical background to prepare students for careers in the chemical and petroleum processing industries, and in a variety of related fields. The program consists of courses in the basic sciences, fundamentals of chemical engineering and elective courses. The elective courses provide an opportunity to obtain background in areas such as natural gas processing, environmental engineering, process dynamics and control, industrial engineering, management sciences, food processing, and polymer engineering.

The Department program gives emphasis to computer applications both in the undergraduate and graduate courses of instruction and in research. This is made possible by the interest of the staff, by the unique facilities available in the Data Acquisition Control and Simulation Centre located in the department, and by the University Computing Services. Instruction is offered in computer oriented mathematical techniques, modelling, analog and digital computer simulation, systems engineering, and in real-time computer applications. Many of these courses are also available to undergraduate students in other branches of engineering or in science.

83.3.2 REQUIRED COURSES

In addition to the courses listed under § 83.1.1, the following are required courses for a B.Sc. in Chemical Engineering:

1. CHEM 350 and 370; PHYS 333; CMPUT 300; CH E 324, 356, 378, 412, 414, 416, 424, 451, 452, 456, 484, 518, 534, 546, 551, 552, 556, 581, 583 and 584.

2. Credit in one of MNL E 352, MEC E 350, or CIV E 360.

3. Credit in one suitable 400 or higher level single-term course in Mathematics or Computing Science.

4. Credit in six single-term approved technical electives.

83.3.3 RECOMMENDED PROGRAM

Third Term

	Hours	Units
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 315 (Calculus III)	3-0-0	3.0
PHYS 333 (Electricity and Magnetism)	3-1s-3	5.0
CHEM 370 (Elementary Physical Chemistry)	3-0-3	4.5
CMPUT 300 (Problem Solving and Programming)	2-0-2	3.0
Elective (e.g., Economics 304)	3-0-0	3.0
		Total 21.5

Fourth Term

	Hours	Units
CHEM 370 (Elementary Physical Chemistry)	3-0-3	4.5
MATH 313 (Differential Equations 1A)	3-0-2	4.0
CH E 324 (Engineering Thermodynamics)	3-1s-0	3.5
CH E 356 (Process Analysis)	2-3s-0	3.5
CH E 378 (Statistical Applications in Chemical Engineering)	2-1s-0	2.5
Elective (e.g., MNL E 352)	3-0-3/2	3.8
		Total 21.8

Fifth Term

	Hours	Units
CHEM 350 (Organic Chemistry)	3-0-3	4.5
CH E 412 (Fluid Mechanics)	3-1s-0	3.5
CH E 424 (Chemical Engineering Thermodynamics)	3-1s-0	3.5
CH E 451 (Chemical Engineering Laboratory I)	1-0-4	3.0
CH E 484 (Industrial Tours—I)	—	—
Elective (e.g., Technical)	3-0-0	3.0
Elective (e.g., Humanities)	3-0-0	3.0
		Total 20.5

Sixth Term

	Hours	Units
CHEM 350 (Organic Chemistry)	3-0-3	4.5
CH E 414 (Heat Transfer)	3-1s-0	3.5
CH E 452 (Chemical Engineering Laboratory II)	1-0-4	3.0
CH E 456 (Chemical Engineering Design I)	2-3s-0	3.5
CH E 484 (Industrial Tours—I)	—	—
Elective (e.g., CH E 476)	3-1s-0	3.5
CH E 416 (Equilibrium Stage Process)	3-2s-0	4.0
		Total 22.0

Seventh Term

	Hours	Units
CH E 518 (Diffusion Operations)	2-2s-0	3.0
CH E 534 (Chemical Reactor Analysis)	3-1s-0	3.5
CH E 546 (Process Dynamics and Control)	3-1s-0	3.5
CH E 551 (Chemical Engineering Laboratory III)	1-0-4	3.0
CH E 581 (Colloquium I)	0-1s-0	0.5
CH E 584 (Industrial Tours—II)	—	—
Elective (e.g., Technical)	3-1s-0	3.5
Elective (e.g., Technical)	3-0-3/2	3.8
		Total 20.8

Eighth Term

	Hours	Units
CH E 552 (Chemical Engineering Laboratory IV)	1-0-4/2	2.0
CH E 556 (Chemical Engineering Design II)	1-0-6	4.0
CH E 583 (Colloquium II)	0-1s-0	0.5
CH E 584 (Industrial Tours—II)	—	—
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
Elective (e.g., Technical)	3-1s-0	3.5
Elective (e.g., Technical)	3-1s-0	3.5
Elective (e.g., Technical)	3-0-3/2	3.8
Elective (e.g., Humanities)	3-0-0	3.0
		Total 21.3

NOTE A: Total units are approximate depending upon choice of electives.

NOTE B: A student with a high academic standing (G.P.A. of 7.5 or better) may make some limited substitutions in the required course pattern.

NOTE C: Students may replace ECON 304 with a suitable alternative course in economics.

NOTE D: All programs require the approval of the Department of Chemical Engineering.

83.3.4 ELECTIVE COURSES

In addition to required courses, programs in Chemical Engineering offer considerable flexibility through electives to develop interdisciplinary interests or to study certain fields in some depth. Subject only to feasibility of timetabling, a student may choose from technical elective courses offered by the Department (CH E 476, 502, 520, 522, 536, 538, 540, 542, 544, 555, 560 and 576) or courses offered by other Departments such as CIV E 520; E E 301, 302, 354; MEC E 413, 465, 512, 513; MNL E 431, 435, 450, 457, 464, 466, 545, 564, 573, 575, 584, 596; ENGG 420; BIOCH 300; CHEM 450, 470; CMPUT 458; GEOG 465; GEOL 320, 401, 460, 523, 524; MARK 405; MATH 408, 413, 414; METEO 407; FD SC 453, 454, 587.

A brief description of some fields in which electives may be chosen follows:

Process Dynamics and Control

Industrial plants are normally designed on the basis of steady state operation, but due to planned changes in process conditions or from unexpected disturbances, such as changes in raw materials, often the operation is not at steady state. As a result modelling of process units and subsequent simulation of their dynamic behavior can significantly assist in achieving efficient operation. Process control is concerned with the development of systems ranging from simple manual instruments to sophisticated computers which will keep industrial units operating at the desired condition. Both areas are becoming increasingly important due to higher performance specifications and the concern for reducing environmental pollution.

Natural Gas and Petroleum Engineering

Many chemical engineering graduates find employment in the oil and gas industries. The Department offers electives in natural gas processing, energy resource development and properties of petroleum fluids. A number of additional elective courses, related to the petroleum or mineral engineering fields, are offered by the Department of Mineral Engineering.

Industrial Engineering and Management Sciences

Chemical engineers very frequently find themselv

employed in a position in which their primary function is management. Consequently elective courses in organization theory, the behavioral sciences, economics, management science and/or operations research provide a useful background for future employment. For those engineers involved in production or design, many tasks will involve establishing optimal operating conditions. The course offered by the Department, although concentrating on optimization techniques, also provides an insight into the scope of operations research. In addition many related courses in the industrial engineering area are given by the Department of Mechanical Engineering.

By proper choice of electives, students may be able to obtain advance credit towards a Master of Business Administration (M.B.A.) or an M.A. in Economics.

Food Processing

A special sequence of electives can be arranged for students who wish to obtain a background in food process engineering. Programs should be developed in consultation with the Department prior to entering the third term.

Environmental Engineering

There is a growing awareness of the need to protect the quality of our environment and as a result many engineers are involved in developing technically and economically feasible solutions to environmental pollution problems. Electives such as CH E 502, CH E 560 and CIV E 520 will help engineering students to become aware of environmental technology and also serve as appropriate background for those desiring to specialize in the environmental field.

83.4 *Third to Eighth Terms — Civil Engineering*

83.4.1 GENERAL INFORMATION

The Civil Engineering curriculum provides a solid grounding in the physical sciences and mathematics, a basic understanding of the major areas of engineering and allows specialization in those areas of civil engineering of particular interest to the individual.

Mathematics and computer courses are oriented to engineering practice. Use of the computer is introduced early in the program, and other courses in civil engineering apply computer techniques to the solution of problems in particular areas of civil engineering.

Throughout, the curriculum is based on the application of mechanics: fluid mechanics, to enable the engineer to control the flow of rivers and to combat the problems of pollution; soil mechanics, to enable the engineer to design foundations, earth structures and roadways; structural mechanics, to enable the engineer to design bridges and buildings. To balance the necessary technical emphasis, civil engineering students study economics, communicative arts and humanities so that they will be aware of the influence of their decisions on the lives of others.

The first four terms of the eight term program contain basic sciences, mathematics and introductory engineering courses. The last four terms are arranged to provide a core of required courses together with a number of optional patterns. Students may select options in the field of their interest in Civil Engineering, or from courses in other faculties and so may emphasize education in one of the many phases of design or management. The total program is designed to provide students with a knowledge of the fundamentals of engineering specialization in the field of their interest, and the capacity to adapt to the challenges facing the practising civil engineer.

83.4.2 REQUIRED COURSES

In addition to the courses listed under § 83.1.1 (the required courses for all students within the Faculty, consisting of 48.2 units of physical and engineering sciences; 3.0 units of economics; and 12.0 units of humanities, social sciences and the communicative arts), the following courses are required for a B.Sc. in Civil Engineering for students entering first year.

1. CIV E 301, 302, 350, 351, 360, 361, 401, 404, 405, 406, 420, 430, 431, 460, 471, 472, 480, 500, 501, 510, 541, 570, 590; E E 301, 302; GEOL 390; MEC E 350; MNL E 352.

2. Additional courses must be taken as technical electives for a credit of not less than 12 units, which may be selected from (a) the technical electives listed in § 83.4.4, or (b) approved courses offered by other Engineering Departments, or, (c) approved courses offered by the Faculties of Arts, Science, Business Administration and Commerce, and Agriculture and Forestry.

All programs must be approved by the Department of Civil Engineering.

83.4.3 RECOMMENDED PROGRAM

Third Term

	Hours	*Units*
CIV E 360 (Mechanics of Deformable Bodies I)	3-0-3	4.5
E E 301 (Elements of Electrical Engineering)	3-0-3/2	3.8
GEOL 390 (Engineering Earth Sciences)	3-0-3	4.5
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 315 (Calculus III)	3-0-0	3.0
MNL E 352 (Materials Science II)	3-0-3/2	3.8
		Total 22.6

Fourth Term

	Hours	*Units*
CIV E 301 (Civil Engineering Design)	2-0-2	3.0
CIV E 302 (Civil Engineering Applications of Computer Programming)	2-0-2	3.0
CIV E 350 (Plane Surveying)	2-0-2	3.0
CIV E 361 (Introduction to Solid Mechanics)	3-1s-0	3.5
E E 302 (Electrical Engineering Devices)	3-0-3/2	3.8
MATH 313 (Differential Equations)	3-0-2	4.0
MEC E 350 (Engineering Mechanics — Dynamics)	3-0-0	3.0
CIV E 351 (Survey Camp) (Two weeks at end of fourth term. Students will be charged for room and board.)		3.0
		Total 26.3

Fifth Term

	Hours	*Units*
CIV E 401 (Civil Engineering Materials)	3-0-3/2	3.8
CIV E 404 (Civil Engineering Analysis I)	2-0-2/2	2.5
CIV E 405 (Civil Engineering Analysis II)	2-0-2/2	2.5
CIV E 430 (Introduction to Fluid Mechanics)	3-0-3/2	3.8
CIV E 460 (Structural Analysis I)	3-1s-0	3.5
CIV E 471 (Structural Design I)	2-0-3/2	2.8
Elective	3-0-0	*3.0
		Total 21.9

Sixth Term

	Hours	Units
CIV E 406 (Civil Engineering Analysis III)	3-0-2	4.0
CIV E 420 (Environmental Engineering I)	3-0-0	3.0
CIV E 431 (Hydraulics)	3-0-3	4.5
CIV E 472 (Structural Design II)	3-0-3	4.5
CIV E 480 (Soil Mechanics)	3-0-3	4.5
Elective	3-0-0	*3.0
		Total 23.5

Seventh Term

	Hours	Units
CIV E 510 (Highway Engineering)	3-0-2	4.0
CIV E 541 (Hydrology)	3-0-3/2	3.8
CIV E 570 (Structural Design III)	3-0-3	4.5
CIV E 590 (Soil Engineering)	3-0-3	4.5
Electives	6-0-0	*6.0
		Total 22.8

Eighth Term

	Hours	Units
CIV E 500 (Civil Engineering Report Writing)	1-2s-0	2.0
CIV E 501 (Project Management)	3-0-3/2	3.8
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
Electives	12-0-0	*12.0
		Total 18.8

*Since laboratory hours are dependent upon the electives chosen, hours of instruction and the associated credit units are approximate. Electives must satisfy the requirements of § 83.1.1 and § 83.4.2.

83.4.4 TECHNICAL ELECTIVES

Electives selected must satisfy the requirements of § 83.4.2.

Technical Electives: Terms 5 or 7

	Hours	Units
CH E 324 (Engineering Thermodynamics)	3-1s-0	3.5
ENGG 420 (Engineering Law)	3-0-0	3.0
CIV E 450 (Geodesy and Photogrammetry)	3-0-3	4.5
ECON 304 (Principles of Economics)	3-0-0	3.0

Technical Electives: Terms 6 or 8

CH E 324 (Engineering Thermodynamics)	3-1s-0	3.5
CH E 560 (Man and His Environment)	3-0-0	3.0
ENGG 420 (Engineering Law)	3-0-0	3.0
CIV E 512 (Town Planning I)	3-1s-0	3.5
ECON 304 (Principles of Economics)	3-0-0	3.0
GEOL 391 (Engineering Geology)	3-0-3	4.5

Technical Electives: Term 7

CIV E 502 (Impact Evaluation of Civil Engineering Projects)	3-2s/2-0	3.5
CIV E 520 (Environmental Engineering II)	3-0-3	4.5
CIV E 540 (Hydraulic Engineering)	3-0-3	4.5
CIV E 550 (Geodesy I)	3-0-3	4.5
CIV E 560 (Structural Analysis II)	3-2s-0	4.0
MEC E 512 (The Design and Implementation of Production Systems)	3-1s-0	3.5
MEC E 551 (Mechanical Vibrations)	3-0-0	3.0
GEOL 482 (Glacial Geology)	3-0-3	4.5

Technical Electives: Term 8

CIV E 511 (Transportation Operations and Planning)	3-0-0	3.0
CIV E 531 (Environmental Fluid Mechanics)	3-0-2	4.0
CIV E 551 (Geodesy II)	3-0-3	4.5
CIV E 571 (Structural Design IV)	3-0-3	4.5
CIV E 591 (Geotechnical Design)	3-0-3	4.5
CIV E 640 (River Engineering) (See Note B)	3-0-1	3.5
CIV E 694 (Permafrost Engineering) (See Note B)	3-0-0	3.0
MEC E 513 (The Scheduling and Control of Production Systems)	3-1s-0	3.5

NOTE A: MEC E 413 will satisfy the Faculty requirement in Economics specified in § 83.1.

NOTE B: A grade point average of at least 7.0 is required to enrol in these courses.

83.5 Third to Eighth Terms—Electrical Engineering

83.5.1 GENERAL INFORMATION

There are 3 basic patterns available in Electrical Engineering.

Pattern I is a general Electrical Engineering program balancing theory and practice. This pattern allows for a choice of third and fourth year options.

Engineering Physics/Pattern II, offered in co-operation with the Department of Physics, is of a more fundamental nature than Pattern I. It provides students with an extensive background in mathematics and physics.

Students who wish to take Engineering Physics/Pattern II must have a high standing in mathematics and physics and normally will be required to have a minimum grade-point average of 7.5 in the first year. Exceptions to this rule may be made by the Chairman of the Department of Electrical Engineering.

Pattern III is intended for those students interested in managerial work and consists of electrical engineering courses augmented by courses in commerce and business administration. Enrolment in Pattern III may be restricted as required. Well qualified students may proceed to an M.B.A. in one additional year after the B.Sc. in Electrical Engineering (Pattern III). Contact the Department for information.

Students entering Pattern III are required to have a grade point average of at least 7.0 in their second year. Those not accepted (at the end of third year) for the accelerated M.B.A. program must return to the Pattern program as early as possible, with courses chosen in consultation with the Department Chairman or his designate. Permission from both Electrical Engineering and Business Administration is required.

In all patterns the core program consists of courses in the basic sciences and electrical engineering courses providing a basis for more intensive studies in a number of specialized areas in Electrical Engineering. These areas are covered by elective courses which may be chosen to meet the student's requirements. Some of these areas are Lasers, Plasmas, Control Systems, Power Systems, Microwave, Communication, High Vacuum, Biomedical Engineering, Digital Electronics.

83.5.2 REQUIRED COURSES

In addition to the courses listed under § 83.1.1, the following are required courses for a B.Sc. in Electrical Engineering.

Patterns I and III:

E E 330, 331, 355, 356, 379, 415, 416, 430, 431, 435, 444, 451, 470, 471, 487, 489, 511, 533, 538, 560, 561, 570; MATH 312, 315, 317, 318, 408; PHYS 331; CH E 324; MEC E 350.

(1) In addition:

Pattern I: MEC E 413.

Pattern III: ECON 304 (third term).

(2) Credit in electives as indicated:

Pattern I:

(a) Two non-technical electives.

(b) Six technical electives as follows: One of the following group of electives: Power: E E 521 and two of E E 501, 507, 525, 527, 531, 545, MEC E 522; Electronics: E E 479, 571, 572; Communication: E E 539, 571, 588, 591; Digital: E E 479, 535, 537, 571; Computer: E E 479, 535, 537, CMPUT 215, 314, 315 and 416 or 417 (E E 511, 533 not required; E E 415, 416 to be taken in Seventh and Eighth Terms). The remaining technical electives with consent of the department.

Pattern III:

(a) Two non-technical electives.

(b) Eight business electives selected from an approved list.

Engineering Physics/Pattern II: E E 330, 331, 355, 356, 430, 431, 435, 451, 471, 538, 560, 561, 570; CH E 324; MATH 312, 315, 317, 318, 408; MA PH 443, 551; PHYS 343, 371, 382, 390, 461, 471, 482, 497, 509, 515. In addition, three technical electives (requiring departmental approval) and two non-technical electives.

83.5.3 RECOMMENDED PROGRAM (PATTERNS I AND III)

Third Term

	Hours	Units
E E 330 (E E Design I)	2-1s-0	2.5
E E 355 (Electrical Circuits I)	3-1s-3/2	4.3
E E 379 (Introduction to Digital Electronics)	3-0-3/4	3.4
MATH 315 (Calculus III)	3-0-0	3.0
MATH 317 (Differential Equations I)	2-1s-0	2.5
MEC E 350 (Engineering and Mechanics: Dynamics)	3-0-0	3.0
	Sub-total	18.7

Additional Courses—*Pattern I*

Elective (non-technical)	3-0-0	3.0
	Sub-total	3.0
	Total	21.7

Additional Courses—*Pattern III*

ECON 304	3-0-0	3.0
	Sub-total	3.0
	Total	21.7

Fourth Term

	Hours	Units
CH E 324 (Thermodynamics)	3-1s-0	3.5
E E 331 (E E Design II)	2-1s-0	2.5
E E 356 (Electrical Circuits II)	3-1s-3/3	4.3
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 318 (Differential Equations II)	2-1s-0	2.5
PHYS 331 (Electricity and Magnetism)	3-2s/2-3/2	4.3
	Total	20.1

Fifth Term

	Hours	Units
E E 430 (Electro-mechanics I)	3-0-0	3.0
E E 435 (Signals and Networks)	3-1s-0	3.5
E E 470 (Electronics I)	3-1s-3/2	4.3
E E 487 (Engineering Applications to Random Processes)	3-0-0	3.0
MATH 408 (Complex Variables)	3-0-0	3.0
	Sub-total	16.8

Additional Courses—*Pattern I (See Note A)*

	Hours	Units
E E 415 (Engineering Electromagnetics I)	3-1s-0	3.5
E E 444 (E E Technical Report Writing)	2-0-0	2.0
	Sub-total	5.5
	Total	22.3

Additional Courses—*Pattern III*

	Hours	Units
Business Electives	6-0-0	6.0
	Sub-total	6.0
	Total	22.8

Sixth Term

	Hours	Units
E E 431 (Electromechanics II)	3-0-3/2	3.8
E E 451 (Network Analysis)	2-1s-3/4	2.9
E E 471 (Electronics II)	3-1s-3/2	4.3
E E 489 (Introduction to Communication Systems)	3-0-0	3.0
	Sub-total	14.0

Additional Courses—*Pattern I (See Note A)*

	Hours	Units
E E 416 (Engineering Electromagnetics II)	2-1s-0	2.5
MEC E 413 (Engineering Evaluation)	3-0-0	3.0
Elective (Technical)	3-0-0	3.0
	Sub-total	8.5
	Total	22.5

Additional Courses—*Pattern III*

	Hours	Units
Elective (Non-Technical)	3-0-0	3.0
Business Electives	6-0-0	6.0
	Sub-total	9.0
	Total	23.0

Seventh Term

	Hours	Units
E E 560 (Control Systems I)	3-0-3	4.5
E E 570 (Electronics III)	3-0-3	4.5
E E 538 (Introduction to Signal Theory and Processing)	3-0-0	3.0
	Sub-total	12.0

Additional Courses—*Pattern I (See Note A)*

	Hours	Units
E E 511 (Analytical Methods of Electrical Engineering)	3-1s-0	3.5
Electives	6-0-0	6.0
	Sub-total	9.5
	Total	21.5

Additional Courses—*Pattern III*

	Hours	Units
E E 415 (Engineering Electromagnetics I)	3-1s-0	3.5
Approved Business Electives	6-0-0	6.0
	Sub-total	9.5
	Total	21.5

Eighth Term

	Hours	Units
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
E E 561 (Control Systems II)	3-0-3	4.5
E E 533 (Electrical Energy Sources)	3-0-0	3.0
	Sub-total	8.5

Additional Courses—*Pattern I (See Note A)*

	Hours	Units
Elective (Non-Technical)	3-0-0	3.0
Electives (Technical)	9-0-3	10.5
	Sub-total	13.5
	Total	22.0

Additional Courses—*Pattern III*

	Hours	Units
E E 416 (Engineering Electromagnetics II)	2-1s-0	2.5
Elective (Non-Technical)	3-0-0	3.0
Business Electives	6-0-0	6.0
	Sub-total	11.5
	Total	19.0

NOTE A: Modifications for the computing stream: CMPUT 215, 315 replace E E 415, 416 in terms 5, 6. E E 415, 416 are then taken in terms 7, 8. CMPUT 314, 416

or 417 replace E E 511, 533. E E 479, 535, 537 and 571 are required in place of technical electives.

83.5.4 RECOMMENDED PROGRAM (ENGINEERING PHYSICS / PATTERN II)

Third Term

	Hours	Units
E E 330 (E E Design I)	2-1s-0	2.5
E E 355 (Electrical Circuits I)	3-1s-3/2	4.3
CH E 324 (Thermodynamics)	3-1s-0	3.5
MATH 315 (Calculus III)	3-0-0	3.0
MATH 317 (Differential Equations I)	2-1s-0	2.5
MEC E 350 (Engineering Mechanics: Dynamics)	3-0-0	3.0
PHYS 382 (Electricity and Magnetism)	2-0-0	2.0
PHYS 390 (Physics Laboratory A)	0-0-3	1.5
		Total 22.3

Fourth Term

	Hours	Units
E E 331 (E E Design II)	2-1s-0	2.5
E E 356 (Electrical Circuits II)	3-1s-3/2	4.3
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 318 (Differential Equations II)	2-1s-0	2.5
PHYS 343 (Mechanics)	3-0-0	3.0
PHYS 371 (Introductory Atomic and Nuclear Physics)	3-0-0	3.0
PHYS 382 (Electricity and Magnetism)	2-0-0	2.0
PHYS 390 (Physics Laboratory)	0-0-6	3.0
		Total 23.3

Fifth Term

	Hours	Units
E E 430 (Electromechanics I)	3-0-0	3.0
E E 435 (Signals and Networks)	3-1s-0	3.5
E E 470 (Electronics I)	3-0-3/2	3.8
MATH 408 (Complex Variables)	3-0-0	3.0
MA PH 443 (Classical Mechanics)	3-0-0	3.0
PHYS 461 (Physical Optics)	3-0-0	3.0
PHYS 482 (Electromagnetic Theory)	3-0-0	3.0
		Total 22.3

Sixth Term

	Hours	Units
E E 423 (Electrical Engineering Analysis)	3-1s-0	3.5
E E 431 (Electromechanics II)	3-0-3/2	3.8
E E 451 (Network Analysis)	2-1s-3/4	2.9
E E 471 (Electronics II)	3-1s-3/2	4.3
PHYS 471 (Quantum Mechanics A)	3-0-0	3.0
PHYS 482 (Electromagnetic Theory)	3-0-0	3.0
PHYS 497 (Physics Laboratory)	0-0-6	3.0
		Total 23.4

Seventh Term

	Hours	Units
E E 538 (Introduction to Signal Theory and Processing)	3-0-0	3.0
E E 560 (Control Systems I)	3-0-3	4.5
E E 570 (Electronics III)	3-0-3	4.5
MA PH 551 (Mathematical Methods of Physics I)	3-0-0	3.0
PHYS 509 (Statistical Physics for Engineers)	3-0-0	3.0
Elective (Non-Technical)	3-0-0	3.0
Elective (Technical)	3-0-0	3.0
		Total 24.0

Eighth Term

	Hours	Units
E E 561 (Control Systems II)	3-0-3	4.5
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
MEC E 413 (Engineering Evaluation)	3-0-0	3.0
PHYS 515 (Introductory Solid State Physics)	3-0-0	3.0
Elective (Non-Technical)	3-0-0	3.0
Electives (Technical)	6-0-0	6.0
		Total 22.0

83.5.5 TECHNICAL ELECTIVES

	Hours	Units
E E 501 (Electrical Design)	3-0-0	3.0
E E 507 (High Voltage Engineering)	3-0-3	4.5
EE / BE 512 (Physical Measurements in Medicine)	3-1s-0	3.5
E E 514 (Reliability Engineering)	3-0-0	3.0
E E 521 (Power Systems I)	3-0-0	3.0
E E 525 (Power Systems II)	3-0-3/2	3.8
E E 527 (Industrial Power Distribution)	3-0-0	3.0
E E 531 (Electrical Machinery)	3-0-3	4.5
E E 533 (Electrical Energy Sources)	3-0-0	3.0
E E 535 (Logical Design of Digital Computers)	3-0-0	3.0
E E 537 (Advanced Digital Topics)	1-0-4	3.0
E E 539 (Digital Signal Processing)	3-0-0	3.0
E E 541 (High Vacuum Technology)	3-0-3/2	3.8
E E 545 (Electrical Instruments and Relays)	3-0-3	3.5
E E 571 (Electronics IV)	3-0-3	4.5
E E 572 (Physical Electronics)	3-0-0	3.0
E E 575 (Generation of High Frequencies)	3-0-3/2	3.8
E E 577 (Pulse and Waveshaping Circuits)	3-0-0	3.0
E E 583 (Introduction to Plasma and Fusion)	3-0-0	3.0
E E 585 (Acoustics)	3-0-0	3.0
E E 586 (Introduction to Fiber Optics Communications)	3-0-0	3.0
E E 588 (Communication in Noise)	3-0-0	3.0
E E 589 (Telecommunication Systems)	3-1s-0	3.5
E E 590 (Engineering Electromagnetics III)	3-0-0	3.0
E E 591 (Engineering Electromagnetics IV)	3-0-0	3.0
E E 593 (Advanced Topics in Engineering Electromagnetics)	3-0-0	3.0
E E 595 (Radiation, Antennas and Propagation)	3-0-0	3.0
E E 596 (Introduction to Principles of Lasers)	3-0-0	3.0
E E 597 (Microwave Engineering)	3-0-3/2	3.8
E E 598 (Special Problems I)	3-0-0	3.0
E E 599 (Special Problems II)	3-0-0	3.0
MEC E 522 (Power Plant Engineering)	3-0-0	3.0
CH E 560 (Man and His Environment)	3-1s-0	3.5
PHYS 531 (Fundamentals of Modern Physics)	3-0-0	3.0

In addition to this list, other courses (e.g., BIOL 210, CMPUT 458, LEG R 310, etc.) may be taken on approval of the Department.

83.6 *Third to Eighth Terms— Mechanical Engineering*

83.6.1 GENERAL INFORMATION

The program of studies in Mechanical Engineering provides a background for careers in research development, design, and manufacture in a wide variety of industries. Graduates normally go into industries such as manufacturing, petro-chemical, pulp and paper, construction, consulting, and energy and resource related industries.

Because of the variety of concepts within Mechanical Engineering there is a considerable selection of courses available. To provide some guidelines in assisting students to choose courses, the department offers patterns of study in each of four general areas namely, Applied Mechanics, Design, Industrial, and Thermo-Science. There can be overlaps in many of these areas and students may select their courses fo

basic knowledge prior to seeking a career in industry, or can select courses as a foundation for a career in research and development. In Applied Mechanics the work emphasizes mechanics of materials, statics and dynamics, vibrations, continuum mechanics, elasticity, plasticity, and stability. Design is concerned with comprehensive systems design, product design, mechanical analysis and mechanisms design, and component design. Industrial engineering caters to students whose interest is the planning and implementation of economic and management systems, especially those applied to scientific and engineering endeavours. In Thermo-Science, courses and specialized work are offered in thermo-dynamics, thermo-power systems, energy conversion, fluid mechanics and heat transfer.

83.6.2 REQUIRED COURSES

In addition to the courses listed in § 83.1.1, the following courses are required for a B.Sc. in Mechanical Engineering.

(1) CH E 324; CH E 476; CIV E 360; CMPUT 300; E E 354, 405; MATH 413; MEC E 350, 360, 402, 403, 413, 431, 440, 460, 461, 470, 501, 503, 523, 550, 560, 561, 584; MNL E 352; PHYS 333; STAT 335.

(2) Credit in one of CH E 548 OR E E 569.

(3) Credit in a minimum of seven elective courses not including those required in the first and second terms. Two of these must be in the humanities and social sciences in order to satisfy Faculty requirements. The remaining five electives are free electives but they are subject to approval by the Department.

83.6.3 RECOMMENDED PROGRAM

Third Term

	Hours	Units
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 315 (Calculus III)	3-0-0	3.0
PHYS 333 (Electricity and Magnetism)	3-1s-3	5.0
MEC E 350 (Engineering Mechanics—Rigid Body Dynamics)	3-0-0	3.0
CIV E 360 (Mechanics of Deformable Bodies)	3-0-3	4.5
CMPUT 300 (Problem Solving and Programming)	2-0-2	3.0
		Total 22.5

Fourth Term

	Hours	Units
MATH 313 (Differential Equations IA)	3-2s-0	4.0
E E 354 (Fundamentals of Electrical Engineering)	3-0-3/2	3.8
CH E 324 (Engineering Thermodynamics)	3-1s-0	3.5
MNL E 352 (Materials Science II)	3-0-3/2	3.8
MEC E 360 (Engineering Design)	2-0-3	3.5
Elective (see Note A)	3-0-0	3.0
		Total 21.6

Fifth Term

	Hours	Units
MEC E 402 (Mechanical Measurements)	3-0-3	4.5
MEC E 413 (Engineering Evaluation)	3-0-0	3.0
MEC E 461 (Machine Components)	2-0-3/2	2.8
MATH 413 (Advanced Calculus I) or	3-0-0	3.0
CH E 476 (Mathematical Application)	3-1s-0	3.5
MEC E 431 (Fluid Mechanics I)	3-0-1	3.5
Elective (see Note A)	3-0-0	3.0
		Total 19.8

Sixth Term

	Hours	Units
STAT 335 (Probability, Statistics and Programming)	3-0-2	4.0
MEC E 403 (Mechanical Engineering Laboratory I)	1-0-3	2.5
MEC E 440 (Applied Thermodynamics)	3-0-0	3.0
MEC E 460 (Mechanics of Machines)	3-0-3/2	3.8
MEC E 470 (Heat Transfer)	3-2s-0	4.0
Elective (see Note A)	3-0-0	3.0
		Total 20.3

Seventh Term

	Hours	Units
E E 405 (Fundamentals of Electrical Engineering)	3-0-3/2	3.8
MEC E 501 (Engineering Design)	1-0-0	1.0
MEC E 503 (Mechanical Engineering Laboratory II)	1-0-3	2.5
MEC E 550 (Vibrations and Sound)	3-1s-0	3.5
MEC E 584 (Advanced Strength of Materials II)	3-0-0	3.0
Elective (see Note A)	3-0-0	3.0
Elective (see Note A)	3-0-0	3.0
		Total 19.8

Eighth Term

	Hours	Units
MEC E 523 (Principles of Heating and Air Conditioning)	3-1s-0	3.5
MEC E 560 (Mechanical Systems Design)	3-0-2	4.0
MEC E 561 (Design Project)	0-0-5	2.5
E E 569 (Feedback Control Systems for Mechanical Engineers) or	3-0-3/2	3.8
CH E 548 (Computer Applications in Process Control)	3-0-3/2	3.8
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
Elective (see Note A)	3-0-0	3.0
Elective (see Note A)	3-0-0	3.0
		Total 20.8

NOTE A: Since hours of instruction depend upon the electives chosen, the numbers shown in the tables are approximate.

83.6.4 ELECTIVE COURSES

Electives in the Mechanical Engineering Program may be chosen from courses offered by the Faculties of Engineering, Agriculture and Forestry, Arts, Business Administration and Commerce, or Science. Departmental approval of all elective courses is required. Students are encouraged to consult with their faculty advisors for assistance in choosing technical and humanities electives.

Typical technical elective courses are: AG EN 342; CIV E 420, 520; CMPUT 458; GEOL 390; ENGG 420; MATH 408, 414, 480; MEC E 412, 450, 464, 465, 481, 490, 512, 513, 522, 531, 537, 541, 543, 553; MNL E 450, 457, 545, 572, 574.

To assist students in planning their technical elective program, the Department schedules groups of courses to avoid timetable conflicts. This enables the students to obtain additional depth in a selected field.

Descriptions of several such fields are listed below. Details of elective patterns may be obtained from the Department.

Mechanical Engineering Systems

Design is one of the main areas of endeavour of professional engineers. Accordingly the Department has established a group of electives, the purpose of which is to teach students to apply scientific principles to obtain realistic solutions to small or large-scale engineer-

ing problems. Emphasis is placed on the philosophy of design, creativity, and the decision-making process with due regard to the impact of technology on society and nature.

Mechanical Engineering Science

Students who are planning careers in the field of research and development or who are contemplating postgraduate study may require a more complete knowledge of the theoretical basis of Mechanical Engineering. For these students, proper selection of elective courses within and outside the Department will provide the necessary background.

Engineering Management

Engineering Management is the application of engineering methods and the principles of scientific management to production, design, improvement, and installation of integrated systems of men, materials and equipment. The management engineer has responsibility in matters of labor measurement, safety, cost reduction and control, quality control and plant layout and design. The management engineer is often a major contributor in management planning and operations research groups.

83.7 *Third to Eighth Terms—Mineral; Mining, Petroleum and Metallurgical Engineering*

83.7.1 GENERAL INFORMATION

The Department of Mineral Engineering offers undergraduate programs in four disciplines: Mineral Engineering, Mining Engineering, Petroleum Engineering and Metallurgical Engineering. These programs are designed to prepare students for engineering careers in the mineral and petroleum industries, and for all industries where materials problems such as corrosion must be considered.

The Mineral Engineering curriculum is designed primarily for students wishing to pursue careers in the area of mineral processing. This field includes the primary processing of fossil fuels such as coal and tar sands, metal-bearing ores and the industrial minerals such as potash. The curriculum permits concentration in related fields such as business, geology, synthetic fuels or computer applications.

Students in Mining Engineering take a program of courses which cover all phases of mining including exploration, rock mechanics, mining methods, materials handling, environmental control, economics and management. Since mining operations must be viewed as part of a system for the discovery and production of materials that are useful to mankind, a number of courses in geology and metallurgy are also included. Several optional courses may be taken to accommodate special interests such as coal and tar sands mining.

Students in Petroleum Engineering will take courses dealing with all aspects of petroleum engineering including courses in drilling and completion, production operations, and reservoir engineering. Students may further their understanding of particular areas of petroleum engineering by taking appropriate optional courses such as heavy oil recovery, in the final two terms.

The Metallurgical Engineering curriculum provides core courses in all phases of the broad field of metallurgy including mineral processing, extractive metallurgy, physical metallurgy, and corrosion. In the final two terms, students are able to specialize in a particular area of metallurgy through selection of appropriate optional courses and their individual research projects.

83.7.2 REQUIRED COURSES

Mineral Engineering

In addition to the courses listed under § 83.1.1 (51.2 units of fundamental science plus 12.0 units in the humanities), the following are required courses for a B.Sc. degree in Mineral Engineering.

(1) CH E 410, 412, 548, 560; CIV E 360; CMPUT 300; E E 301, 302; GEOL 308, 401; MNL E 352, 390, 422, 431, 435, 495, 499, 528, 533, 540, 541, 542, 549, 597, 599.

(2) Either CHEM 370 or CIV E 350/351 must be taken.

(3) Additional courses must be taken to reach a total of 165 units (not including CIV E 351, Survey Camp).

Mining Engineering

In addition to the courses listed under § 83.1.1, the following courses are required to graduate with a B.Sc. in Mining Engineering:

(1) CH E 412; CIV E 350, 351, 360; CMPUT 300; E E 301; GEOL 401, 440; MEC E 512; MNL E 352, 390, 401, 406, 410, 416, 421, 422, 423, 430, 431, 435, 495, 499, 502, 507, 513, 514, 516, 527, 528, 529, 599.

(2) Additional courses must be chosen from an approved list of technical electives to reach a total of 170 units.

Petroleum Engineering

In addition to the courses listed under § 83.1.1, the following courses are required to graduate with a B.Sc. in Petroleum Engineering:

(1) CH E 324, 410, 412; CHEM 370; CIV E 360; CMPUT 300; E E 301, 302; ECON 365; ENGG 420; GEOL 320, 401; MNL E 352, 390, 422, 462, 464, 466, 495, 499, 564, 573, 575, 577, 584, 588, 589, 596, 597, 599.

(2) Additional courses must be taken to reach a total of 165 units.

Metallurgical Engineering

In addition to the courses listed under § 83.1.1, the following courses are required to graduate with a B.Sc. in Metallurgical Engineering:

(1) CH E 410, 412, 548; CHEM 370; CIV E 360; CMPUT 300; GEOL 401; MNL E 352, 390, 431, 432, 440, 457, 458, 495, 499, 530, 540, 541, 545, 548, 549, 552, 553, 597, 599; PHYS 333.

(2) Additional courses must be taken to reach a total of 165 units, including 6 units from an approved list of technical electives.

All programs in the Department of Mineral Engineering must be approved. Under some circumstances, students may be given approval to replace some of the required courses to allow further specialization in an area of particular interest.

A Business/Economics program is available to well-qualified students which may permit them to proceed to an M.B.A. or an M.A. in Economics in one additional year after the B.Sc. Details of these programs are available from the Department of Mineral Engineering.

The next MNL E 528/548 field trip will be in the fall of 1981. Students are required to pay for their food and lodging on the field trip and a levy of not more than $50 is made for transportation expenses.

NOTE A: Students in Metallurgical Engineering and Petroleum Engineering will take CHEM 370 (Physical Chemistry). Students in Mining Engineering will take E E

301 (Elements of Electrical Engineering). Students in Mineral Engineering will take CHEM 370 or an elective.

NOTE B: Students in Mining Engineering will take CIV E 350 (Plane Surveying), CIV E 351 (Survey Camp) and GEOL 440 (Petrology). Students in Petroleum Engineering will take CHEM 370 and CH E 324 (Engineering Thermodynamics). Students in Metallurgical Engineering will take CHEM 370 and an elective. Students in Mineral Engineering will take CHEM 370 and an elective or CIV E 350, 351 and an elective.

NOTE C: Since the hours of instruction depend on the electives chosen, the numbers shown in the tables are approximate.

83.7.3 RECOMMENDED PROGRAM FOR ALL STUDENTS IN THE DEPARTMENT OF MINERAL ENGINEERING

Third Term

	Hours	Units
CIV E 360 (Mechanics of Deformable Bodies I)	3-0-3	4.5
CMPUT 300 (Problem Solving and Programming)	2-0-2	3.0
GEOL 401 (Basic Geology)	3-0-3	4.5
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
MATH 315 (Calculus III)	3-0-0	3.0
Elective (see Note A)	3-0-3/2	3.8
		Total 21.8

Fourth Term

	Hours	Units
MNL E 390 (Intro. to Mineral Engineering)	2-0-3/2	2.8
MATH 313 (Differential Equations IA)	3-2s-0	4.0
ECON 304 (Principles of Economics)	3-0-0	3.0
MNL E 352 (Materials Science II)	3-0-3/2	3.8
Electives (see Note B)	6-0-3	7.5
		Total 21.1

83.7.4 RECOMMENDED PROGRAM MINERAL ENGINEERING

Fifth Term

	Hours	Units
CH E 412 (Fluid Mechanics)	3-1s-0	3.5
E E 301 (Elements of Electrical Eng.)	3-0-3/2	3.8
MNL E 422 (Rock Mechanics I)	3-0-0	3.0
MNL E 431 (Mineral Processing I)	3-0-3	4.5
MNL E 495 (Statistical Methods for Mineral Engineers)	2-0-1	2.5
MNL E 499 (Mineral Seminar I)	0-1s-0	0.5
Elective (See Note C)		3.0
		Total 20.8

Sixth Term

	Hours	Units
CH E 410 (Heat and Mass Transfer)	3-1s-0	3.5
E E 302 (Electrical Eng. Devices)	3-0-3/2	3.8
GEOL 308 (Earth's Physical Resources)	3-0-0	3.0
MNL E 435 (Extractive Metallurgy)	2-0-3/2	2.8
Electives (See Note C)		7.0
		Total 20.1

Seventh Term

	Hours	Units
MNL E 528 (Mining Field Trip)	—	—
MNL E 533 (Mineral Processing II)	3-0-3/2	3.8
MNL E 540 (Met. Research Project I)	0-0-3	1.5
MNL E 542 (Metallurgical Plant Design)	2-0-3/2	2.8
MNL E 597 (Operations Research)	3-0-1	3.5
MNL E 599 (Mineral Seminar II)	0-1s-0	0.5
Electives (See Note C)		7.6
		Total 20.2

Eighth Term

	Hours	Units
CH E 548 (Comp. App. in Process Control)	3-0-3/2	3.8
CH E 560 (Man and His Environment)	3-1s-0	3.5
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
MNL E 541 (Met. Research Project II)	0-0-6	3.0
MNL E 549 (Metallurgical Seminar)	1-0-0	1.0
Electives (See Note C)		7.0
		Total 19.3

83.7.5 RECOMMENDED PROGRAM MINING ENGINEERING

Fifth Term

	Hours	Units
CH E 412 (Fluid Mechanics)	3-1s-0	3.5
MNL E 401 (Mine Plant Engineering)	3-0-3/2	3.8
MNL E 416 (Mineral Deposits and Exploration)	3-0-3	4.5
MNL E 422 (Rock Structures and Intact Rock Properties)	3-0-3/2	3.8
MNL E 495 (Statistical Methods for Mineral Engineers)	2-1s-0	2.5
MNL E 499 (Mineral Seminar I)	0-1s-0	0.5
Elective (Humanities and Social Sciences)	3-0-0	3.0
		Total 21.6

Sixth Term

	Hours	Units
MNL E 406 (Principles of Mine Ventilation)	2-0-3/2	2.8
MNL E 410 (Mine Economics and Organization	3-0-0	3.0
MNL E 423 (Rock Mechanics)	3-0-3/2	3.8
MNL E 430 (Mine Transport and Materials Handling)	3-0-3/2	3.8
MNL E 516 (Mine Development and Explosives)	3-0-0	3.0
Elective (Humanities and Social Sciences)	3-0-0	3.0
		Total 19.4

Seventh Term

	Hours	Units
MEC E 512 (The Design and Implementation of Production Systems)	3-1s-0	3.5
MNL E 431 (Mineral Processing)	3-0-3	4.5
MNL E 513 (Surface Mining)	3-0-3/2	3.8
MNL E 514 (Underground Mining Methods)	3-0-3/2	3.8
MNL E 528 (Mining Field Trip)	—	—
MNL E 599 (Mineral Seminar II)	0-1s-0	0.5
Electives (See Note C)		6.0
		Total 22.1

Eighth Term

	Hours	Units
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
MNL E 435 (Extractive Metallurgy)	2-0-3/2	2.8
MNL E 502 (Mine Design)	0-0-6	3.0
MNL E 507 (Mine Safety)	2-0-3/2	2.8
MNL E 529 (Mining Seminar)	1-0-0	1.0
Electives (See Note C)		7.7
		Total 18.3

83.7.6 RECOMMENDED PROGRAM PETROLEUM ENGINEERING

Fifth Term

	Hours	Units
E E 301 (Elements of Electrical Eng.)	3-0-3/2	3.8
CH E 412 (Fluid Mechanics)	3-1s-0	3.5
MNL E 422 (Rock Mechanics I)	3-0-0	3.0
MNL E 462 (Petroleum Reservoir Fluids)	3-1s-0	3.5
MNL E 464 (Drilling & Completion)	3-1s-0	3.5
MNL E 588 (Petroleum Field Trip)	—	—

MNL E 495 (Statistical Methods for Mineral Engineers)	2-1s-0	2.5
MNL E 499 (Mineral Seminar I)	0-1s-0	0.5
		Total 20.3

Sixth Term

	Hours	Units
CH E 410 (Heat and Mass Transfer)	3-0-1	3.5
E E 302 (Electrical Eng. Devices)	3-0-3/2	3.8
ENGG 420 (Engineering Law)	3-0-0	3.0
GEOL 320 (Sedimentation & Stratigraphy)	3-0-3	4.5
MNL E 466 (Pet. Production Operations)	3-0-0	3.0
MNL E 564 (Well Logging and Formation Evaluation)	3-0-0	3.0
		Total 20.8

Seventh Term

	Hours	Units
ECON 365 (Resource Economics)	3-0-0	3.0
MNL E 573 (Fundamental Reservoir Eng.)	3-0-3/2	3.8
MNL E 584 (Petroleum Engineering Design)	2-0-3	3.5
MNL E 597 (Operations Research)	3-1s-0	3.5
MNL E 599 (Mineral Seminar II)	0-1s-0	0.5
Elective (e.g. Humanities)		3.0
Elective (See Note C)		3.0
		Total 20.3

Eighth Term

	Hours	Units
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
MNL E 575 (Applied Reservoir Eng.)	3-1s-0	3.5
MNL E 577 (Modelling in Petroleum Engineering)	3-0-0	3.0
MNL E 589 (Petroleum Seminar)	1-0-0	1.0
MNL E 596 (Case Studies in Mineral Engineering)	1-3s-0	2.5
Elective (e.g. Humanities)		3.0
Elective (See Note C)		3.3
		Total 17.3

83.7.7 RECOMMENDED PROGRAM METALLURGICAL ENGINEERING

Fifth Term

	Hours	Units
CH E 412 (Fluid Mechanics)	3-1s-0	3.5
MNL E 431 (Mineral Processing I)	3-0-3	4.5
MNL E 440 (Met. Thermodynamics & Kinetics)	3-0-0	3.0
MNL E 457 (Fundamentals of Physical Metallurgy I)	3-0-3	4.5
MNL E 495 (Statistical Methods for Mineral Engineers)	2-1s-0	2.5
MNL E 499 (Mineral Seminar I)	0-1s-0	0.5
Elective (See Note C)		3.0
		Total 21.5

Sixth Term

	Hours	Units
CH E 410 (Heat and Mass Transfer)	3-1s-0	3.5
MNL E 432 (Pyrometallurgy)	3-0-3/2	3.8
MNL E 545 (Corrosion & Oxidation)	3-0-0	3.0
MNL E 458 (Fund. of Physical Met. II)	3-0-3	4.5
PHYS 333 (Electricity & Magnetism)	3-1s-3	5.0
		Total 19.8

Seventh Term

	Hours	Units
MNL E 530 (Hydrometallurgy & Electrometallurgy)	3-0-3/2	3.8
MNL E 540 (Met. Research Project I)	0-0-3	1.5
MNL E 548 (Metallurgical Field Trip)	— —	— —
MNL E 552 (Applications of Physical Met. I)	3-0-3/2	3.8
MNL E 597 (Operations Research)	3-1s-0	3.5
MNL E 599 (Mineral Seminar II)	0-1s-0	0.5
Elective (e.g. Humanities)		3.0
Elective (See Note C)		3.8
		Total 19.9

Eighth Term

	Hours	Units
CH E 548 (Comp. Appl. in Process Control)	3-0-3/2	3.8
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
MNL E 541 (Met. Research Project II)	0-0-6	3.0
MNL E 549 (Metallurgical Seminar)	1-0-0	1.0
MNL E 553 (Applications of Phys. Met. II)	3-0-3/2	3.8
Elective (e.g. Humanities)		3.0
Elective (See Note C)		3.2
		Total 18.8

83.7.8 ELECTIVE COURSES

Elective courses for all programs in Mineral Engineering may be chosen from those offered by the Department, the Faculty of Engineering, or by the Faculties of Arts, Science, Business Administration and Commerce. Departmental approval is required for all elective courses.

83.8 B.Sc. Program in Agricultural Engineering

A four-year program in Agricultural Engineering is offered cooperatively by the Faculty of Agriculture and Forestry and the Faculty of Engineering. The program is administered by a Joint Agricultural Engineering Curriculum Committee consisting of the Deans of the Faculty of Agriculture and Forestry and the Faculty of Engineering (or their representatives), the Agricultural Engineering Program Coordinator, the Chairman, Department of Agricultural Engineering, or another member of the Department if the Chairman is also Coordinator, and two full-time Academic members selected by and from the Faculty of Engineering.

For administrative purposes students in the program will be registered in the Faculty of Agriculture and Forestry.

(1) *Admission.* The matriculation requirements are set out in section 13.3.1. of the University Regulations and Information for Students calendar.

(2) *Promotion.* Promotion from year to year will be decided by the Joint Committee but in general the requirements for promotion will be the same as those of the Faculty of Engineering.

(3) *Graduation.* The Joint Committee will recommend approval of the candidate for the degree by the Council of the Faculty of Agriculture and Forestry.

(4) *Scholarships.* Details of scholarships for which students in the program are eligible are listed under the Faculty of Agriculture and Forestry and Faculty of Engineering Awards section of the Calendar.

ALL INQUIRIES SHOULD BE DIRECTED TO THE DEAN OF THE FACULTY OF AGRICULTURE AND FORESTRY (TELEPHONE 432-4931) OR THE CHAIRMAN OF THE DEPARTMENT OF AGRICULTURAL ENGINEERING (TELEPHONE 432-4251).

83.8.1 GENERAL INFORMATION

Agricultural Engineering applies engineering principles to the industry of agriculture. It involves engineering design of machinery, structures and environmental systems for plant and animal production, use of energy sources, processing systems for agricultural products and applications of engineering to the use of soil, water and other natural resources.

The program of studies in Agricultural Engineering provides a background for careers in design, development, manufacture, testing and research in industries related to agricultural production.

The core curriculum contains basic sciences, mathematics as well as introductory engineering and agricultural courses.

The selection of technical electives allows students to obtain additional depth in Agricultural Engineering and / or related areas.

The next field trip will be in September 1982.

83.8.2 REQUIRED COURSES

In addition to the courses listed under 83.1.1 (the required courses for all students within the Faculty consisting of 48.2 units of physical and engineering sciences; 3 units of economics; and 12 units of humanities, social sciences and the communicative arts), the following courses are required for a B.Sc. in Agricultural Engineering.

(1) AG EN 301, 313, 413, 421, 453, 454, 500, 503, 510, CH E 324, CIV E 350, 351, 360, 473, 480, E E 301, 302, FD SC 588, MEC E 350, 431, SOILS 310.

(2) credit in: one of BIOL 296, 298 or 299; credit in: one of AN SC 300, 372 or 460; credit in: one of PL SC 300, 352, 354, 355, or 341; credit in: CMPUT 300 or equivalent; credit in: STATS 241 or equivalent.

(3) credit in a minimum of 12 units of approved technical electives.

A student with a high academic standing (GPA 7.0 or better) may make some limited substitutions in the required course pattern, in order to obtain additional depth in a specific area.

All programs must be approved by the Department of Agricultural Engineering.

83.8.3 RECOMMENDED PROGRAM

First Term — Detailed in § 83.2

Second Term — Detailed in § 83.2

Third Term

	Hours	Units
MATH 312 (Linear Algebra and Infinite Series)	3-0-0	3.0
CMPUT 300 (Problem Solving and Programming)	2-0-1	2.5
SOILS 310 (Introduction to Soil Science)	3-0-3	4.5
AG EN 313 (Soil and Water Engineering)	3-0-2	4.0
Elective (eg. Humanities)	3-0-0	3.0
Elective (eg. BIOL 296)	3-0-3	4.5
		Total *21.5

Fourth Term

	Hours	Units
MATH 313 (Differential Equations I)	3-0-2	4.0
MATH 315 (Calculus III)	3-0-0	3.0
CIV E 350 (Plane Surveying)	2-0-2	3.0
CIV E 360 (Mechanics of Deformable Bodies)	3-0-3	4.5
CH E 324 (Engineering Thermodynamics)	3-1s-0	3.5
MEC E 350 (Engineering Mechanics — Dynamics)	3-0-0	3.0
CIV E 351 (Survey Camp)		3.0
		Total 24.0

Fifth Term

	Hours	Units
E E 301 (Elements of Electrical Engineering)	3-0-3/2	3.8
MEC E 431 (Fluid Mechanics I)	3-0-1	3.5
AG EN 301 (Heating and Ventilating and Air Conditioning Agricultural Buildings)	3-0-3	4.5
Elective (e.g. STAT 241)	3-0-2	4.0
Elective (e.g. Humanities)	3-0-0	3.0
AG EN 500 (Agricultural Engineering Field Trip)	—	—
		Total *18.8

Sixth Term

	Hours	Units
E E 302 (Electrical Engineering Devices)	3-0-3/2	3.8
CIV E 473 (Introduction to Structural Design)	3-0-3	4.5
CIV E 480 (Soil Mechanics)	3-0-3	4.5
AG EN 421 (Simulation Methods in Agricultural Engineering)	3-0-3	4.5
Elective (e.g. Technical)	3-0-0	3.0
Elective (e.g. PL SC 300)	3-0-0	3.0
		Total *23.3

Seventh Term

	Hours	Units
AG EN 453 (Power Units)	3-0-3	4.5
FD SC 588 (Heat and Mass Transfer in Food Engineering)	3-0-0	3.0
Elective (e.g. AN SC 372)	3-0-3	4.5
Elective (e.g. Technical)	3-0-0	3.0
Elective (e.g. Technical)	3-0-0	3.0
Elective (e.g. Humanities)	3-0-0	3.0
		Total *21.0

Eighth Term

	Hours	Units
AG EN 413 (Irrigation and Drainage Engineering)	3-0-3	4.5
AG EN 454 (Agricultural Machinery)	3-0-3	4.5
AG EN 503 (Instrumentation in Agricultural Engineering)	3-0-3	4.5
AG EN 510 (Agricultural Engineering Project)	1-0-4	3.0
ENGG 500 (The Practice of the Engineering Profession)	1-0-0	1.0
Elective (e.g., Technical)	3-0-0	3.0
		Total *20.5

*Total units are approximate depending on choice of electives.

83.8.4 ELECTIVE COURSES

Electives in the Agricultural Engineering Program may be chosen from courses offered by the Faculties of Agriculture and Forestry, Arts, Business Administration and Commerce, Engineering or Science.

Typical technical elective courses are: AG EN 420, 456, 552, 555; CIV E 420, 431, 520, 541, 590, LEG R 310; CHEM 250; CMPUT 458; CH E 548; E E 569; ENGG 420; MATH 413; MEC E 460, 461, 464, 481, 541, 584; MNL E 351, 352; MICRB 201; SOILS 360, 425, 440, 470.

Students will consult with their faculty advisors for assistance in choosing technical and humanities electives. All programs must be approved by the department.

83.9 Graduate Studies

The University of Alberta offers the degrees of Master of Engineering, Master of Science, and Doctor of Philosophy in many fields of Engineering. Details of these programs are given in the Faculty of Graduate Studies and Research Calendar.

84.1 General Information

Courses offered by the Faculty of Engineering are listed here in alphabetical order; courses open to Engineering students but offered by other faculties are listed separately in § 84.9. Agricultural Engineering courses are listed in § 84.8.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

"☐" — This symbol stands for "course units". The number following indicates the units of the course as used in computing grade-point averages. The number of units is based on the number of hours of lectures, seminars, and laboratories. Some honors and graduate courses involving research may vary in unit value according to the length and difficulty of the research project. Some courses are offered for credit only, and carry no unit value.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hour (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single term course, the term in which it may be offered is mentioned before the hours of instruction.

"★" — This symbol stands for "course weight". The number following indicates the weight of the course as used in computing grade-point averages for students who are registered in a faculty other than Engineering.

Prerequisite requirements have in some cases been listed. Confirmation of whether or not a course has a prerequisite must be obtained from the Department.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

84.2 Chemical Engineering

84.2.1 UNDERGRADUATE COURSES

CH E 324. *Engineering Thermodynamics.* ☐ 3.5 (either term, 3-1s-0). An introduction to the first and second laws of thermodynamics. Prerequisite: MATH 213. (★3.)

CH E 356. *Process Analysis.* ☐ 3.5 (Second Term, 2-3s-0). Steady and unsteady state; material and energy balances; introduction to process engineering economics. Corequisites: CH E 324, CHEM 370 and MATH 315 or equivalent. (★3.)

CH E 378. *Statistical Applications in Chemical Engineering.* ☐ 2.5 (Second Term, 2-1s-0). Statistical methods for the analysis of problems in the field of engineering. Prerequisite: MATH 213, Prerequisite or Corequisite: CMPUT 300. (★2.)

CH E 410. *Heat and Mass Transfer.* ☐ 3.5 (Second Term, 3-1s-0). Steady and unsteady conduction; convection; thermal radiation; leaching; extraction; absorption; distillation. Prerequisite: CH E 412. (★3.)

CH E 412. *Fluid Mechanics.* ☐ 3.5 (First Term, 3-1s-0). Newtonian and non-Newtonian fluid behavior; viscometric measurements; elements of potential and boundary layer theory; laminar, turbulent and compressible flow; two-phase flow, settling of solids, porous media. Prerequisites: CH E 356, MATH 313 and 315. (★3.)

CH E 414. *Heat Transfer.* ☐ 3.5 (Second Term, 3-1s-0). Conduction; thermal radiation; convection; evaporation; macroscopic energy balances. Prerequisite: CH E 412. (★3.)

CH E 416. *Equilibrium Stage Processes.* ☐ 4.0 (Second Term, 3-2s-0). Design of separation processes with emphasis on equilibrium stage concept, distillation, absorption, extraction, and adsorption. Prerequisite: CHEM 370. (★3.)

CH E 424. *Chemical Engineering Thermodynamics.* ☐ 3.5 (First Term, 3-1s-0). The thermodynamics of non-ideal gases and liquids; vapor-liquid equilibrium, and thermodynamics of chemical processes. Prerequisites: CH E 324 and MATH 313 or equivalent. (★3.)

CH E 451. *Chemical Engineering Laboratory I.* ☐ 3.0 (First Term, 1-0-4). Experiments in fluid mechanics. Corequisite: CH E 412. (★3.)

CH E 452. *Chemical Engineering Laboratory II.* ☐ 3.0 (Second Term, 1-0-4). Experiments in heat transfer and thermodynamics. Corequisite: CH E 414. (★3.)

CH E 456. *Chemical Engineering Design I.* ☐ 3.5 (Second Term, 2-3s-0). Engineering design concepts; profitability analysis; engineering economics; projects planning and scheduling: selected projected design examples. Prerequisites: CH E 356 and MATH 312. (★3.)

CH E 476. *Mathematical Application.* ☐ 3.5 (either term, 3-1s-0). Mathematical formulation of engineering problems; solution of the resulting equations. Prerequisites: MATH 313 and 315. (★3.)

CH E 484. *Industrial Tours—I.* ☐ 0.0. Guided visits to selected industrial plants, laboratories and field installations. Corequisite: CH E 451. (★0.)

CH E 502. *Process Design for Pollution Control.* ☐ 3.5 (First Term, 3-1s-0). A course designed to deal with special processes, design techniques and operating procedures related to environmental and ecological considerations. Emphasis is placed on the fundamentals of air pollution and its control. Prerequisite: Consent of instructor. (★3.)

CH E 518. *Diffusion Operations.* ☐ 3.0 (Second Term, 2-2s-0). Molecular diffusion; mass transfer coefficients; design of continuous contact mass transfer processes including absorption, humidification, and drying. Prerequisite: CH E 412. (★3.)

CH E 520. *Energy Resource Development.* ☐ 3.0 (Second Term, 3-0-0). A broad technological and economic assessment of energy resource development projects in Western Canada. Medium and long term scientific and technological perspectives. Future supply-demand scenarios analyzed by large scale energy models such as AERAM and PILOT. Implications of policy decisions in the areas of taxation, financing arrangements, export-import restrictions and energy pricing regulations. (The course is interdisciplinary, with lecturers from several University departments including the Department of Economics.) Prerequisite: Consent of instructor. (★3.)

CH E 522. *Natural Gas Processing.* ☐ 3.5 (Second Term, 3-1s-0). An introduction to the physical, chemical and engineering principles required for the design and operation of plants used for the treatment of natural gas and associated liquids. The removal and recovery of sulphur plus other substances obtained from natural gas is also considered. Prerequisites: CH E 414, 424, and 416, or consent of instructor. (★3.)

CH E 534. *Chemical Reactor Analysis.* ☐ 3.5 (First Term, 3-1s-0). Kinetics of homogeneous and heterogeneous chemical reactions; design of chemical reactors and related equipment. Prerequisites: CH E 414 and CHEM 370. (★3.)

CH E 536. *Chemical Kinetics and Catalysis.* ☐ 3.5 (First Term, 3-1s-0). Characterization of heterogeneous catalysts; mechanisms and kinetics of heterogeneously catalyzed reactions. Prerequisite: CH E 414 or consent of instructor. (★3.)

CH E 538. *Polymer Reactor Engineering.* ☐ 3.5 (Second Term, 3-1s-0). Introduction to chain and step polymerization kinetics; physical, chemical and mechanical characterization methods for polymers; bulk, suspension, solution and emulsion polymerization processes; copolymers; polymerization reactor design and control. Prerequisite: CH E 534 or consent of instructor.

CH E 540. *Introduction to Real-Time Computer Applications.* ☐ 4.5 (First Term, 3-0-3). Introduction to real-time computer hardware and operating systems; data acquisition techniques; analog supervisory and direct-digital control; applications involving research experiments, analytical instruments and analog-digital computer hybrid systems; data processing techniques. Laboratory will involve student use of Department's real-time digital computer and interfaced applications. Prerequisite: CMPUT 300 or equivalent. (★3.)

CH E 542. *Process Modelling and Simulation.* ☐ 3.8 (First Term, 3-0-3/2). Modelling of process systems; analog simulation; digital simulation; numerical solutions. Prerequisite: CH E 414. (★3.)

CH E 544. *Process Control.* ☐ 3.8 (Second Term, 3-0-3/2). Linear and non-linear analysis; process equipment control schemes; sampled data and computer control. Prerequisite: CH E 546. (★3.)

CH E 546. *Process Dynamics and Control.* ☐ 3.5 (First Term, 3-1s-0). Control applications; process transfer functions; transient response; stability criteria; real-time data acquisition and computer control. Prerequisites: MATH 313 and 315. (★3.)

CH E 548. *Computer Applications in Process Control.* ☐ 3.8 (Second Term, 3-0-3/2). Block diagrams; transfer functions of systems of interest to process engineers; analog simulation; frequency response; time and frequency domain control system design techniques; control system design by computer; computer control. Prerequisites: MATH 313 and 315. (★3.)

CH E 551. *Chemical Engineering Laboratory III.* ☐ 3.0 (First Term, 1-0-4). Experiments in control, kinetics and mass transfer. Corequisites: CH E 416 and 534. (★3.)

CH E 552. *Chemical Engineering Laboratory IV.* ☐ 2.0 (Second Term, 1-0-4/2). Projects in Chemical Engineering. Prerequisites: CH E 416 and 534. (★3.)

CH E 555. *Process Optimization.* ☐ 3.5 (Second Term, 3-1s-0). Single and multivariable search techniques; linear programming; dynamic programming; EVOP; variational methods. Prerequisites: CH E 414 and MATH 313 or consent of instructor. (★3.)

CH E 556. *Chemical Engineering Design II.* ☐ 4.0 (Second Term, 1-0-6). Integration of chemical engineering practice and theory in the design of a processing plant. Prerequisites: CH E 416, 456 and 534. (★3.)

CH E 560. *Man and His Environment.* ☐ 3.5 (Second Term 3-1s-0). The massive environmental problems of over-population, pollution and scarcity of non-renewable resources will be considered quantitatively and from a systems point of view. Topics include: demographic analysis; energy, mineral, water and agricultural resources; environmental degradation; structure of urban communities; concepts of an ecosystem; computer models of complex systems. Course is interdisciplinary, with lecturers from several University Departments. Restricted to students registered in the 6th to 8th terms. (★3.)

CH E 576. *Mathematical Applications.* ☐ 3.0 (First Term, 3-0-0). Mathematical formulation of engineering problems; solution of the resulting differential equations by transform techniques: Laplace, Fourier, and Z-transformations; considerations of stability. Prerequisites: MATH 313 and 315. (★3.)

CH E 581. *Colloquium I.* ☐ 0.5 (First Term, 0-1s-0). Oral presentation of technical material. Prerequisite: CH E 456. (★1.)

CH E 583. *Colloquium II.* ☐ 0.5 (Second Term, 0-1s-0). Oral presentation of technical material. Prerequisite: CH E 581. (★1.)

CH E 584. *Industrial Tours—II.* ☐ 0.0. Guided visits to selected industrial plants, laboratories and field installations. Prerequisite: CH E 484. (★0.)

84.2.2 GRADUATE COURSES

CH E 610. *Advanced Mass Transfer Operations.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CH E 612. *Advanced Fluid Mechanics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 613. *Selected Topics in Mass Transfer.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CH E 614. *Advanced Heat Transfer.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CH E 615. *Advanced Separation Processes.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 616. *Rheology and Polymer Processing.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CH E 622. *Advanced Physical Properties and Behavior of Petroleum Fluids.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 624. *Advanced Thermodynamics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 634. *Advanced Chemical Reactor Design.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 636. *Advanced Chemical Kinetics and Catalysis.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 640. *Real-Time Computer Applications.* ☐ 4.5 (First Term, 3-0-3). Note: Credit will not be given for both CH E 640 and CH E 540. (★3.)

CH E 642. *Dynamics of Process Systems.* ☐ 3.8 (Second Term, 3-0-3/2). (★3.)

CH E 644. *Advanced Process Control.* ☐ 3.8 (Second Term, 3-0-3/2). (★3.)

CH E 654. *Decision Analysis.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 674. *Numerical Solutions of Engineering Problems.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 676. *Applied Mathematics I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CH E 678. *Applied Mathematics II.* ☐ 3.0 (either term, 3-0-0). (★3.)

CH E 682. *Graduate Seminar.* ☐ 0.5 (0-1s-0). (★1.)

CH E 694. *Advanced Topics in Chemical Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CH E 900. *Non-Thesis Project.* ☐ 3.0 (Variable). (★3.)

84.3 *Civil Engineering*

84.3.1 UNDERGRADUATE COURSES

CIV E 301. *Civil Engineering Design.* ☐ 3.0 (Second Term, 2-0-2). Introduction to basic concepts of design, systems analysis and decision making as applied to civil engineering problems. Prerequisite: MATH 312; corequisite: CIV E 302 or equivalent. (★3.)

CIV E 302. *Civil Engineering Applications of Computer Programming.* ☐ 3.0 (Second Term, 2-0-2). Fortran programming with Civil Engineering applications. (★3.)

CIV E 350. *Plane Surveying.* ☐ 3.0 (Second Term, 2-0-2). Surveying instruments, measurement and measurement errors, field surveying, electronic distance measurements, computations. (★3.)

CIV E 351. *Survey Camp.* ☐ 3.0 (Two weeks at end of Second Term). Practical exercises in field methods, project type of assignments; field astronomy, electronic distance measuring instruments. Note: Survey School is held off campus. Prerequisite: CIV E 350. (★3.)

CIV E 360. *Mechanics of Deformable Bodies I.* ☐ 4.5 (either term, 3-0-3). Plane stress and strain; stress-strain relationships; stresses and deformations resulting from axial and transverse loads; buckling of columns; torsion of circular sections; combined stress and statically indeterminate problems; Laboratory to demonstrate mechanical properties and verify assumptions of analysis. Prerequisites: ENGG 231 and MATH 213. (★3.)

CIV E 361. *Introduction to Solid Mechanics.* ☐ 3.5 (Second Term, 3-1s-0). Stress, strain and displacements in two and three dimensions. Stress-strain relations. Governing equations of elasticity and simple solutions. Strain energy and virtual work. Theories of failure. Prerequisites: CIV E 360 and MATH 315. (★3.)

CIV E 401. *Civil Engineering Materials.* ☐ 3.8 (First Term, 3-0-3/2). Properties of Portland cement concrete related to micro- and macro-structure and constituent materials; properties of bituminous materials and design of bituminous mixes; epoxy compounds. Prerequisite: MNL E 352. (★3.)

CIV E 404. *Civil Engineering Analysis I.* ☐ 2.5 (First Term, 2-0-2/2). The formulation of partial differential equations modelling civil engineering problems and an introduction to classical solution techniques. Prerequisites: MATH 313 and CIV E 361. (★3.)

CIV E 405. *Civil Engineering Analysis II.* ☐ 2.5 (First Term, 2-0-2/2). Statistical and probabilistic approaches to civil engineering problems. Prerequisites: MATH 213 and CIV E 302. (★3.)

CIV E 408. *Civil Engineering Analysis III.* ☐ 4.0 (Second Term, 3-0-2). Application of numerical methods to civil engineering problems. Prerequisites: CIV E 302, MATH 312 and 315. (★3.)

CIV E 420 *Environmental Engineering I.* ☐ 3.0 (Second Term, 3-0-0). Domestic and industrial requirements, transportation, and distribution of water; water quality and chemistry; physical, chemical, and biological treatment processes for water and wastes. Prerequisite: CHEM 203 or equivalent. (★3.)

CIV E 430. *Introduction to Fluid Mechanics* ☐ 3.8 (First Term, 3-0-3/2). Fundamental principles of fluid mechanics; an introduction to the first and second laws of thermodynamics. Prerequisite: MEC E 350. (★3.)

CIV E 431. *Hydraulics.* ☐ 4.5 (Second Term, 3-0-3). Similitude and dimensional analysis; closed conduit flow; rotodynamic machines; open channel flow, unsteady flow. Prerequisite: CIV E 430. (★3.)

CIV E 450. *Geodesy and Photogrammetry.* ☐ 4.5 (First Term, 3-0-3). Geodesy; cartography; legal survey systems; photogrammetry; photographic interpretation; application in laboratory. Prerequisite: CIV E 350. (★3.)

CIV E 460. *Structural Analysis I.* ☐ 3.5 (First Term, 3-1s-0). Deformations of statically determinate beams, trusses and frames, influence lines; analysis of statically indeterminate structures by consistent deformations, slope deflection and moment distribution. Prerequisite: CIV E 360. (★3.)

CIV E 471. *Structural Design I.* ☐ 2.8 (First Term, 2-0-3/2). Introduction to structural design; loads; design of timber beams, columns, connections and curved members. Prerequisite: CIV E 360. (★3.)

CIV E 472. *Structural Design II.* ☐ 4.5 (Second Term, 3-0-3). Ultimate strength design of reinforced concrete beams, columns, footings and slabs. Prerequisite: CIV E 471. (★3.)

CIV E 473. *Introduction to Structural Design.* ☐ 4.5 (Second Term, 3-0-3). Fundamental principles of structural design; loadings; timber, steel and concrete beams, columns and connections. This course is not offered to students in Civil Engineering. Prerequisite: CIV E 360. (★3.)

CIV E 480. *Soil Mechanics.* ☐ 4.5 (Second Term, 3-0-3). Soil classifications; site investigation; principle of effective stress; theories of steady seepage and consolidation; compaction of soils; mechanical properties of soils; introduction to the application of the theories of elasticity and plasticity. Prerequisites: GEOL 390 and CIV E 361 or equivalent. Corequisite: CIV E 406. (★3.)

CIV E 500. *Civil Engineering Report Writing.* ☐ 2.0 (Second Term, 1-2s-0). Written and oral communication; lectures and practice on presentation of oral and written reports; a comprehensive written report must be submitted by each student. Prerequisite: Consent of the Department. (★3.)

CIV E 501. *Project Management.* ☐ 3.8 (Second Term, 3-0-3/2). Planning and scheduling; theories and techniques of project management. Prerequisite: CIV E 301. (★3.)

CIV E 502. *Impact Evaluation of Civil Engineering Projects.* ☐ 3.5 (Second Term, 3-2s/2-0). The need and regulations concerning environmental impact assessment are presented. Methods of analysis (matrix and network analysis techniques), parameter considerations, decision criteria, project evaluation and modification criteria, decision models, and impact of past projects. Prerequisite: CIV E 420 or consent of Department. (★3.)

CIV E 510. *Highway Engineering.* ☐ 4.0 (First Term, 3-0-2). Traffic planning; highway economics; geometric design. Earthwork; compaction, frost action; pavement design; stabilization; construction and maintenance. Prerequisites: CIV E 350, 401 and 480. (★3.)

CIV E 511. *Transportation Operations and Planning.* ☐ 3.0 (Second Term, 3-0-0). Elements of transportation systems, surveys, traffic control, principles of transportation planning, transportation management, urban transportation alternatives. Prerequisite: CIV E 510. (★3.)

CIV E 512. *Town Planning.* ☐ 3.5 (Second Term, 3-1s-0). Historical growth and development of cities; growth and decay; population forecasting; urban land use and land planning; transportation planning; public services; planning legislation; outline plan preparation. Prerequisite: CIV E 420 or consent of Department. (★3.)

CIV E 520. *Environmental Engineering II.* ☐ 4.5 (First Term, 3-0-3). Municipal engineering; general effects of wastes on the environment; solid wastes management; design of storm drains, subdivision regulations and major design projects; laboratory tests on water and wastes; field trip. Prerequisite: CIV E 420 or consent of Department. (★3.)

CIV E 531. *Environmental Fluid Mechanics.* ☐ 4.0 (Second Term, 3-0-2). Turbulent flow: equations of motion and pollutant conservation equation; slender flows, jets and plumes. Mixing processes in rivers and lakes. Hydraulics of hot water and effluent discharges into water bodies. Oil spill in rivers and ocean. Prerequisite: CIV E 431. (★3.)

CIV E 540. *Hydraulic Engineering.* ☐ 4.5 (First Term, 3-0-3). Transient flow, pump and turbine characteristics, spillway and control structures. Prerequisite: CIV E 431. (★3.)

CIV E 541. *Hydrology.* ☐ 3.8 (First Term, 3-0-3/2). Water occurrence in nature and its relation to civil engineering; analysis of precipitation and stream flow data, precipitation-runoff relationships, ground water, river behavior. Prerequisite: Consent of Department. (★3.)

CIV E 550. *Geodesy I.* ☐ 4.5 (First Term, 3-0-3). Review of concepts in matrix algebra and in statistics; history and need for geodetic systems; three dimensional and terrestrial coordinate systems. Geometry of the ellipsoid. Types of latitude, Gauss and Soldner spheres; relationships between latitude and coordinate systems. Geodetic datums; topocentric systems; radii of curvature; curves on the ellipsoid; normal sections and geodesics; reduction of observations to ellipsoid surface. Lengths, angles, and coordinates on the ellipsoid. Prerequisite: Consent of the Department. (★3.)

CIV E 551. *Geodesy II.* ☐ 4.5 (Second Term, 3-0-3). Computations on the ellipsoid; direct and inverse problems in three dimensions; conformal mapping projections; meridian convergence; projected curves; loxodromes; mercator, transverse, and UTM projections. Physical geodesy; gravity and systems of heights; reductions and anomalies. Prerequisite: CIV E 550. (★3.)

CIV E 552. *Higher Surveying I.* ☐ 4.5 (First Term, 3-0-3). Methods of precise surveying with theodolites, tapes, electronic distance measuring equipment and precise levelling. Computations and error analysis. First and second order trilateration and triangulation procedures. Introduction to design of survey control networks. Prerequisites: CIV E 350 and 405 or consent of instructor. (★3.)

CIV E 553. *Higher Surveying II.* ☐ 4.5 (Second Term, 3-0-3). Application of statistical methods to: the analysis and design of measurement systems; the adjustment of triangulation, trilateration, traverse and control networks. Mathematical models and step by step adjustment procedures. Prerequisite: CIV E 552. Note: CIV E 550 and CIV E 551 will be offered in alternate years with CIV E 552 and 553. (★3.)

CIV E 560. *Structural Analysis II.* ☐ 4.0 (First Term, 3-2s-0). Numerical analysis of beams and columns; matrix methods. Prerequisite: CIV E 460. (★3.)

CIV E 570. *Structural Design III.* ☐ 4.5 (First Term, 3-0-3). Limit states design of steel structures, including tension members, columns, beams, beam-columns, composite beams, and connections. Prerequisite: CIV E 471. (★3.)

CIV E 571. *Structural Design IV.* ☐ 4.5 (Second Term, 3-0-3). Design of steel plate girders; design of prestressed concrete structures; design of masonry and reinforced masonry structural components. Two major design projects constitute the laboratory portion. Prerequisites: CIV E 472 and 570. (★3.)

CIV E 590. *Soil Engineering.* ☐ 4.5 (First Term, 3-0-3). Stability of natural slopes, cuts, and embankments, theories of earth pressure; design of temporary excavations and earth retaining structures; settlements of foundations; bearing capacity of foundations; pile foundations. Prerequisite: CIV E 480. (★3.)

CIV E 591. *Geotechnical Design.* ☐ 4.5 (Second Term, 3-0-3). Design and analysis of shallow and deep foundations and retaining structures. Slope stability of embankments and cuts including foundation excavations. Special problems in dewatering and underpinning. Prerequisite: CIV E 590. (★3.)

84.3.2 GRADUATE COURSES

CIV E 601. *Cement and Concrete Technology.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 609. *Special Topics in Civil Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 610. *Pavement Design.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 611. *Pavement Materials.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 612. *Transportation Design.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 613. *Transportation Systems Analysis.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 614. *Transportation Engineering.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 615. *Functional Planning and Geometric Design.* ☐ 3.5 (Second Term, 2-0-3). (★3.)

CIV E 616. *Public Transportation.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 619. *Advanced Topics in Transportation and Highway Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 620. *Environmental Engineering Measurements I.* ☐ 4.0 (First Term, 1-0-6). (★3.)

CIV E 621. *Municipal Distribution and Collection Systems.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 622. *Physical/Chemical Water and Wastewater Treatment.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 623. *Industrial Water and Wastewater Management.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 624. *Biological Waste Treatment Processes.* ☐ 3.0 (Second Term, 3-0-0). (★3.).

CIV E 625. *Engineering Management of Water Quality.* ☐ 3.0 (First Term, 3-0-0). (★3.).

CIV E 626. *Environmental Health Engineering.* ☐ 3.0 (Second Term, 3-0-0). (★3.).

CIV E 627. *Environmental Engineering Measurements II.* ☐ 4.0 (Spring Session, 1-0-6). (★3.).

CIV E 629. *Advanced Topics in Environmental Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 630. *Open Channel Flow.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 631. *Engineering Fluid Mechanics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 632. *Hydraulic Structures.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 633. *Unsteady Flow in Pipes and Channels.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 634. *Applied Hydrodynamics.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 635. *Turbulent Flow.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 636. *Ice Engineering.* ☐ 3.5 (either term, 3-0-1). (★3.).

CIV E 639. *Advanced Topics in Fluid Mechanics and Hydraulics.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 640. *River Engineering.* ☐ 3.5 (Second Term, 3-0-1). (★3.)

CIV E 641. *Surface Water Hydrology.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 642. *Risk and Decision in Civil Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 643. *Flow Through Porous Media.* ☐ 3.5 (either term, 3-0-1). (★3.)

CIV E 644. *Sediment Transport.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 649. *Advanced Topics in Hydrology.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 660. *Advanced Structural Analysis I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 661. *Advanced Structural Analysis II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 663. *Design of Shell Structures.* ☐ 3.0 (either term, 3-0-0). Offered alternate years. (★3.)

CIV E 664. *Introduction to Solid Mechanics.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 665. *Introduction to Finite Element Methods.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 666. *Structural Concepts.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 667. *Advanced Topics in the Finite Element Method.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 670. *Behavior and Design of Steel Members.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 671. *Behavior and Design of Steel Structures.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 672. *Behavior and Design of Concrete Members.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 673. *Behavior and Design of Concrete Structures.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 674. *Behavior and Design of Prestressed Concrete Structures.* ☐ 3.0 (either term, 3-0-0). (★3.).

CIV E 675. *Structural Analysis and Design.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 676. *Behavior and Design of Masonry Structures.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 679. *Advanced Topics in Structural Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 680. *Engineering Properties of Soils.* ☐ 4.0 (First Term, 3-1s-1). (★3.)

CIV E 681. *Seepage and Drainage.* ☐ 4.0 (First Term, 3-1s-1). (★3.)

CIV E 683. *Site Investigation Practice.* ☐ 2.0 (First Term, 2-0-0). (★3.)

CIV E 684. *Engineering Geology and Terrain Analysis.* ☐ 4.0 (First Term, 3-1s-1). (★3.)

CIV E 690. *Advanced Foundation Engineering.* ☐ 5.0 (Second Term, 4-1s-1). (★6.)

CIV E 693. *Foundation Engineering.* ☐ 3.0 (First Term, 3-0-0). (★3.)

CIV E 694. *Permafrost Engineering.* ☐ 4.0 (Second Term, 3-1s-1). (★3.)

CIV E 695. *Soil Structures.* ☐ 4.0 (Second Term, 3-1s-1). (★3.)

CIV E 696. *Geotechnical Aspects in Highway Engineering.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

CIV E 697. *Rock Engineering.* ☐ 4.0 (Second Term, 3-1s-1). (★3.)

CIV E 698. *Geotechnical Engineering of Oil Sands Development.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 699. *Advanced Topics in Soil Mechanics.* ☐ 3.0 (either term, 3-0-0). (★3.)

CIV E 900. *Non-Thesis Project.* ☐ 3.0. (Variable). (★3.)

84.4 *Electrical Engineering*

84.4.1 UNDERGRADUATE COURSES

NOTE A: A course listed for either term will be offered in either the First or the Second Term, not both.

NOTE B: In some cases prerequisite requirements may be waived with the consent of the Department.

E E 301. *Elements of Electrical Engineering.* ☐ 3.8 (First Term, 3-0-3/2). Circuit parameters, Kirchoff's Laws, basic circuit analysis including loop and node methods, Thevenin, natural and forced responses, steady state AC, power, power factor. Three phase, power transmission, frequency response and Bode plots, two ports. (★3.)

E E 302. *Electrical Engineering Devices.* ☐ 3.8 (Second Term, 3-0-3/2). Semi-conductors, rectification, transistor circuits and characteristics, amplifiers, feedback, special electronic devices, DC machines and speed control. AC machines, motor selection, introduction to feedback control. Transducers. Prerequisite: E E 301 or consent of the Department. (★3.)

E E 330. *Electrical Engineering Design I.* ☐ 2.5 (First Term, 2-1s-0). Introduction to Fortran programming; error analysis applied to electrical measurements; root solving and least square curve fitting in electrical engineering design. Corequisite: E E 355. (★3.)

E E 331. *Electrical Engineering Design II.* ☐ 2.5 (Second Term, 2-1s-0). Advanced Fortran programming techniques; numerical techniques applied to Electrical Engineering problems; numerical integration, interpolation, Runga Kutta methods, solution of linear and nonlinear circuit equations. Prerequisite: E E 330 or CMPUT 214; corequiste: E E 356. (★3.)

E E 354. *Fundamentals of Electrical Engineering.* ☐ 3.8 (Second Term, 3-0-3/2). Physical concepts of resistance, inductance and capacitance. Kirchoff's Laws and circuit equations of DC networks, magnetic circuits, energy concepts, time domain analysis of R-L, R-C and R-L-C networks, complex numbers and phasor algebra, impedance concept, power factor, resonance, three phase circuits, network theorems, measuring instruments, vacuum tube and transistor. (★3.)

E E 355. *Electrical Circuits I.* ☐ 4.3 (First Term, 3-1s-3/2). Definitions of linear elements, dependent and independent sources, sign conventions, basic circuit laws; node and mesh analysis, Thevenin, Norton and other theorems; phasor concepts, impedance, admittance, A.C. (sinusoidal) circuit analysis, validity of laws and theorems, phasor diagrams; average, effective values of waveforms, real, reactive and complex power, power factor correction; wye and delta

3-phase circuits, 3-phase power measurements; resonant circuits, frequency response, Q, half power points, bandwidth, effect on Q of non-ideal elements; mutual inductance, coupling. Prerequisite: MATH 213; corequisite MATH 317 (★3.)

E E 356. *Electrical Circuits II.* ☐ 4.3 (Second Term, 3-1s-3/2). Network topology-definitions of nodes, branches, network, graph, tree and links, independent network equations, loop and nodal analysis, self and mutual impedance and admittance; network transients — R-C, R-L, and R-L-C first and higher order systems, forced solutions, complete response using initial conditions for exponential and sinusoidal excitation; electronic devices, semi-conductor diodes, diode applications, transistors. Prerequisites: MATH 317 and E E 355. (★3.)

E E 379. *Introduction to Digital Electronics.* ☐ 3.4 (First Term, 3-0-3/4). Boolean Algebra including truth tables and Venn diagrams. Switching devices and their symbology with an introduction to NAND and NOR logic. Number systems, codes, minimization procedures, synthesis of combinational networks. Synchronous sequential circuits, flip-flops, counters. (No prerequisite). (★3.)

E E 403. *Electronic Instrumentation.* ☐ 3.8 (Second Term, 3-0-3/2). Fundamentals of electronics; amplification, oscillation, modulation applied to measuring instruments; methods of measuring non-electrical quantities. Examples of biomedical instrumentation. The laboratory will illustrate the use and limitations of typical instruments. Note: This course is offered for students of the Biological and Medical Sciences. (★3.)

E E 405. *Fundamentals of Electrical Engineering (for Mechanical Engineers).* ☐ 3.8 (Second Term, 3-0-3/2). Introduction to electronics, operational amplifiers and applications in instrumentation, higher-power electronic devices and applications; DC and AC rotating machines; speed control, machine selection; transient behavior and use of the Laplace transform. Prerequisites: E E 354. and PHYS 333 (★3.)

E E 415. *Engineering Electromagnetics I.* ☐ 3.5 (First Term, 3-1s-0). Review of vector calculus, electrostatics, and magnetostatics. Electric and magnetic fields in material media, including polarization mechanisms and generalized boundary conditions on D and H. Solutions to static field problems. Introduction to time-varying electromagnetic fields, including Maxwell's equations and waves in free space. Prerequisites: MATH 315, 318 and PHYS 331. (★3.)

E E 416. *Engineering Electromagnetics II.* ☐ 2.5 (Second Term, 2-1s-0). Wave impedance, velocities, and polarization. Standing and travelling waves. Poynting's theorem. Propagation in conducting media and dielectrics. Reflection and refraction. Transmission lines, including impedance matching and the Smith Chart. Rectangular waveguides. Prerequisite: E E 415. (★3.)

E E 423. *Electrical Engineering Analysis II.* ☐ 3.5 (Second Term, 3-1s-0). Applications of the theory of partial differential equations to Maxwell's equations, the diffusion equation, the transmission line equation, the Laplace equation. Transform methods. Prerequisite: E E 435. (★3.)

E E 430. *Electromechanics I.* ☐ 3.0 (First Term, 3-0-0). Magnetic circuits analysis with AC and DC excitation; properties of ferromagnetic materials; hysteresis and eddy current losses, stored energy, transformers, mechanical forces in magnetic devices, modelling and analysis of transducers. Prerequisite: E E 355. (★3.)

E E 431. *Electromechanics II.* ☐ 3.8 (Second Term, 3-0-3/2). An extension of E E 430 to rotating machines. Analysis and performance of DC, induction, and synchronous machines. Prerequisite: E E 430. (★3.)

E E 435. *Signals and Networks.* ☐ 3.5 (First Term, 3-1s-0). Signal representation by discrete, continuous and generalized exponentials (Fourier series and Transforms and Laplace Transforms), convolution and superposition integrals. Application of Laplace Transforms to networks, Bode diagrams, single and double tuned circuits, stability of networks. Prerequisites: E E 356; MATH 312, 315 and 318. (★3.)

E E 444. *Scientific and Technical Writing.* ☐ 2.0 (First Term, 2-0-0). Letters and technical memoranda. Professional resumes. Report writing: collecting and presenting material, communications planning sheets, abstracts, key words, referencing. The language of patents and other special documents; preparing and presenting "papers". Specific rules of style in technical and scientific writing. Writing R and D proposals.(★3.)

E E 451. *Network Analysis.* ☐ 2.9 (Second Term, 2-1s-3/4). Two port networks, Bessel filters; realizability; network synthesis (including driving point impedances; Foster and Cauer forms). Filter synthesis with passive and active components; sensitivity; practical constraints. Prerequisite: E E 435. (★3.)

E E 470. *Electronics I Active Devices.* ☐ 4.3 (First Term, 3-1s-3/2). Transport phenomena in semiconductors, characteristics of junction diodes, bipolar transistors and FETs. Transistor biasing and thermal stabilization. Transistor circuit models. Prerequisites: E E 356, and MATH 317. (★3.)

E E 471. *Electronics II Active Devices.* ☐ 4.3 (Second Term, 3-1s-3/2). Biasing and stability of active devices. Circuit and Device parameters, equivalent ciruits. AC analysis of active devices in various network configurations, frequency characteristics, Bode plots, feedback amplifiers. Prerequisite: E E 470. (★3.)

E E 479. *Digital Logic Design.* ☐ 3.4 (Second Term, 3-0-3/4). A continuation of E E 379. Design and realization of synchronous and asynchronous sequential circuits. Iterative networks, networks for arithmetic operations. Hazards in sequential networks. Special purpose devices including multiplexers, decoders, fast address multipliers, Arithmetic Logic Units, pressetable counters, etc. Error detecting codes. An introduction to micropressors. Prerequisite E E 379. (★3.)

E E 487. *Engineering Applications to Random Processes.* ☐ 3.0 (First Term, 3-0-0). Basic concepts and fundamental techniques of probability are applied to communications, telephone traffic, maintenance, reliability, queuing, random processes including coding, surges, and fading of signals. (★3.)

E E 489. *Introduction to Communication Systems.* ☐ 3.0 (Second Term, 3-0-0). Spectral analysis, amplitude modulation, multiplexing, frequency modulation and pulse code modulation. Prerequisite: E E 435. (★3.)

E E 501. *Electrical Design.* ☐ 3.0 (First Term, 3-0-0). Electrical design starting from fundamental principles using engineering methods. (★3.)

E E 507. *High Voltage Engineering.* ☐ 4.5 (Second Term, 3-0-3). High voltage phenomena on transmission lines, dielectric phenomena. AC testing, impulse testing and rating, grounding, circuit breaking. (★3.)

E E 511. *Analytical Methods of Electrical Engineering.* ☐ 3.5 (First Term, 3-1s-0). Applications of the theory of partial differential equations to Maxwell's equations, heat flow problems, the transmission line equation and Laplace's equation. Boundary value problems; Bessel functions; numerical methods. Prerequisite: E E 435. (★3.)

EE / BE 512. *Physical Measurements in Medicine.* ☐ 3.5 (Second Term, 3-1s-0). Properties of the cell membrane, Nernst-Planck equation, Donnan membrane, constant field membrane, membrane impedance. Action potentials, voltage clamp measurements, membrane conductance, H-H equations, nerve conduction. Mathematical models of the axon. Electrodes. Gas and blood gas analysis. The E.C.G., E.E.G., and the E.M.G., origin and type of these signals, measurement techniques. Blood flow and blood pressure measurements (invasive and non-invasive). Safety aspects of electrical equipment in medicine. Prerequisite: Consent of Department. (★3.)

E E 514. *Reliability Engineering.* ☐ 3.0 (either term, 3-0-0). Study of how and why electrical and mechanical systems and components fail; Murphy's law; definitions of reliability and failure modes; practical statistical distributions and frequency and duration approach for designing and evaluating system and component reliability levels; repairable, non-repairable and standby systems. Prerequisite: E E 487 or equivalent (★3.)

E E 521. *Power Systems I.* ☐ 3.0 (First Term, 3-0-0). Power system components, performance and characteristics of transmission lines, compensation, load flow and matrix methods, economic dispatch, DC transmission. (★3.)

E E 525. *Power Systems II.* ☐ 3.8 (Second Term, 3-0-3/2). Faults and unbalanced operation of systems, symmetrical components, stability and control, circuit breakers, tie line control, overvoltages, lightning and switching surges. Prerequisite: E E 521. (★3.)

E E 527. *Industrial Power Distribution.* ☐ 3.0 (First Term, 3-0-0). Fundamentals of engineering design of electrical distribution systems for buildings and electrical plants. Current design practices and engineering methods. Prerequisite: E E 43 (★3.)

E E 531. *Electrical Machinery.* ☐ 4.5 (First Term, 3-0-3). Electrical machinery: DC machines, power rectifying equip

ment, AC commutator machines and a more detailed study of selected topics from electrical engineering. Prerequisite: E E 431 (★3.)

E E 533. *Electrical Energy Sources.* ☐ 3.0 (Second Term, 3-0-0). Current energy consumptions and reserves. Growth rates. Electrical energy sources and their cost. This includes hydro generators, fossil fuel sources, nuclear fission reactors, MHD generators, solar cells, wind generators, thermonic generators, thermoelectric generators, fuel cells, nuclear fusion reactors, geothermal power sources. (★3.)

E E 535. *Advanced Digital Logic Design.* ☐ 3.0 (First Term, 3-0-0). Detailed study of programming and structure of various microcomputers. Typical design of logic systems using LSI components. Types of memories. A/D and D/A converters and their applications. Prerequisite: E E 479.(★3.)

E E 537. *Advanced Digital Topics.* ☐ 3.0 (Second Term, 1-0-4). Microprocessor circuitry and applications, with emphasis on laboratory construction. Prerequisites: E E 479 and 535. Enrolment by consent of Department. (★3.)

E E 538. *Introduction to Signal Theory and Processing.* ☐ 3.0 (First Term, 3-0-0). Review of Fourier analysis; sampled signals and the sampling theorem; the z-transform; design of recursive digital filters; discrete Fourier Transform, the periodogram. Fast Fourier Transform, Algorithms, aliasing, leakage; spectral analysis, applications. Prerequisites: E E 435 and 487. (★3.)

E E 539. *Digital Signal Processing.* ☐ 3.0 (Second Term, 3-0-0). Digital filter design, realization, and hardware implementation; finite-word-length effects. Selected applications. Prerequisites: E E 535, and 538. (★3.)

E E 541. *High Vacuum Technology.* ☐ 3.8 (Second Term, 3-0-3/2). Gas kinetics, gas flow, pumping speed theory, system design, pumping methods and pressure measurements, fabrication and leak detection techniques, adsorption and desorption processes, vacuum deposition techniques. (★3.)

E E 545. *Electrical Instruments and Relays.* ☐ 4.5 (Second Term, 3-0-3). A study of modern AC instruments, relays, and applications. (★3.)

E E 550. *Network Theory — Synthesis.* ☐ 3.0 (First Term, 3-0-0). Realizability, network synthesis (including driving-point impedances, Cauer and Foster forms), filter synthesis with passive and active components, including sensitivity and practical constraints. Prerequisite: E E 451. (★3.)

E E 560. *Control Systems I.* ☐ 4.5 (First Term, 3-0-3). Mathematical modeling of components, processes, and systems. Signal flow graphs, transfer functions and frequency response. Stability analyses of open and closed loop systems (Routh-Hurwitz criterion, root-locus method, Nyquist criterion). Error coefficients and time domain specifications. Basic compensation methods. Prerequisites: E E 435, 451 and MATH 408. (★3.)

E E 561. *Control Systems II.* ☐ 4.5 (Second Term, 3-0-3). Important nonlinearities in systems; describing function method. State space method to describe systems; the phase plane method. Economic systems, ecological systems. System dynamics approach. Simulation. Digital systems and design of digital controllers. Prerequisite: E E 560. (★3.)

E E 569. *Feedback Control Systems for Mechanical Engineers.* ☐ 3.8 (Second Term, 3-0-3/2). Linear models of electrical, mechanical, hydraulic and electromechanical components used in control systems. Block diagrams. Transfer functions. Time domain analysis of control systems. Root-locus diagrams. Frequency response. Stability considerations. Compensation of control systems. (★3.)

E E 570. *Electronics III.* ☐ 4.5 (First Term, 3-0-3). Linear and non-linear waveshaping circuits, large-signal models for bipolar and field-effect transistors, generation of linear voltage sweeps, multivibrators, gate circuits, A/D and D/A converters. Prerequisite: E E 471. (★3.)

E E 571. *Electronics IV.* ☐ 4.5 (Second Term, 3-0-3). Operational amplifier techniques, active filters, small-signal models for bipolar and field-effect transistors, tuned and untuned amplifiers, sinusoidal oscillators, modulation and demodulation techniques, device and system noise. Prerequisites: E E 451 and 570. (★3.)

E E 572. *Physical Electronics.* ☐ 3.0 (First Term, 3-0-0). Crystalline solids; quantum and wave theory of solids, electrons in periodic lattices; semiconductors; metal- structure; metal-insulator-semiconductor structure; high electric fields in semiconductors and failure mechanisms of semiconductor devices. Corequisite: E E 511. (★3.)

E E 575. *Generation of High Frequencies.* ☐ 3.8 (Second Term, 3-0-3/2). Fundamentals of microwave amplifiers and oscillators. Introduction to the principles of operation and the properties of important microwave tubes and microwave semiconductor devices. Prerequisite: E E 416. (★3.)

E E 577. *Pulse and Waveshaping Circuits.* ☐ 3.0 (Second Term, 3-0-0). Waveshaping circuits using passive elements and active devices; pulse generating circuits, mainly multivibrators and blocking oscillators; generation of linear voltage and current sweeps; other topics such as counting circuits, gating circuits, applications to computers, television, etc. Prerequisite: E E 471. Corequisite: E E 570. (★3.)

E E 583. *Introduction to Plasma and Fusion.* ☐ 3.0 (First Term, 3-0-0). Energy sources and conditions for nuclear fusion. Behavior of plasma. Collision phenomena. Boltzmann equation, transport properties, electrical breakdown of gases. Hydrodynamic and individual particle methods. Current experimental approaches to fusion — steady state and pulsed. State-of-the-art in confinement and heating of plasma. (★3.)

E E 585. *Acoustics.* ☐ 3.0 (First Term, 3-0-0). General laws; impedance; transducers; enclosures; room acoustics; etc. (★3.)

E E 586. *Introduction to Optical Fiber Communications.* ☐ 3.0 (Second Term, 3-0-0). Aspects of light transfer through dielectric fibers; optical and physical properties of optical fiber cables; principles and characteristics of sources and photodetectors. System design, light coupling, color multiplexing. Prerequisite: E E 416. (★3.).

E E 588. *Communication in Noise.* ☐ 3.0 (Second Term, 3-0-0). Probability, random variables and processes, Gaussian noise, noise in AM and FM Systems, data transmission, information theory and coding. Prerequisites: E E 487 and 489. (★3.)

E E 589. *Telecommunication Systems.* ☐ 3.5 (Second Term, 3-1s-0). Common-carrier telecommunication systems (including telephone networks); signal quality and systems specifications; exchange switching and queuing; distortion and signal-to-noise ratio; multiplexing, modems and frequency converters; transmission media, digital transmission methods, and system constraints; signal conditioning; field trips. Prerequisite: E E 587. (★3.)

E E 590. *Engineering Electromagnetics III.* ☐ 2.0 (First Term, 2-0-0). Cylindrical waveguides; cavity resonators, Q-factor, introduction to perturbation theory. Special theory of relativity; Lorentz transformation, relativistic kinematics, relativistic optics, space-time and 4-vectors, relativistic mechanics. Prerequisite: E E 416; corequisite: E E 511. (★3.)

E E 591. *Engineering Electromagnetics IV.* ☐ 3.0 (either term, 3-0-0). Introduction to radiation, antenna fundamentals, self- and mutual-impedances of linear antennas, arrays of linear antennas, practical considerations and feeding arrangements. Friis transmission equation, propagation between elevated antennas over a lossy earth, Fresnel zones and the effect of obstacles, earth curvature and the effects of normal refraction and ducting, tropospheric scatter, propagation in an ionized medium, ionospheric critical frequency and MUF. Prerequisites: E E 356 and 416. (★3.)

E E 593. *Advanced Topics in Engineering Electromagnetics.* ☐ 3.0 (Second Term, 3-0-0). Engineering aspects of wave propagation in ionized gases, waves in anisotropic media (including ferrites), magnetohydrodynamics, space charge waves, travelling wave tubes, accelerators, periodically loaded structures, surface waveguides, forces on dielectric and magnetic materials in non-uniform fields and their biomedical and industrial applications, perturbation theory. (★3.)

E E 596. *Introduction to Principles and Physics of Lasers.* ☐ 3.0 (Second Term, 3-0-0). Interaction of radiation with atoms, laser oscillations and threshold conditions, 3- and 4-level laser systems, rate equations, special properties of laser light, cavity Q and photon lifetime, optical resonators and lens waveguides, Gaussian beams, gain saturation, Q-switching, mode locking, interaction of light and sound, holography. Description of various lasers: solid, gas, semiconductor, dye, Raman and chemical. Laser applications. Prerequisite: E E 416 or equivalent. (★3.)

E E 597. *Microwave Engineering.* ☐ 3.8 (First Term, 3-0-3/2). Properties of transmission media, synthesis of impedance transformers, microwave junctions, scattering matrix and scattering parameters, properties of microwave cavities, filters, ferrite circulators and isolators. Prerequisite: E E 416. (★3.)

E E 598. *Special Problems I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 599. *Special Problems II.* ☐ 3.0 (Second Term, 3-0-0). Courses E E 598 and 599 are intended to enable individuals or a small group of students to study topics in their particular field of interest under the supervision of a member of the Faculty. (★3.)

84.4.2 GRADUATE COURSES

E E 600. *Research Project.* ☐ 0.5 (Second Term, 0-2s-0). (★0.)

E E 601. *Special Topics in Electrical Engineering I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 602. *Special Topics in Electrical Engineering II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 603. *Departmental Research Seminar I.* ☐ 0.5 (First Term, 0-2s-0). (★0.)

E E 609. *Departmental Research Seminar II.* ☐ 0.5 (Second Term, 0-2s-0). (★0.)

E E 622. *Power System Problems I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 623. *Power System Problems II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 628. *Radio Astronomy Techniques.* ☐ 3.0 (Second Term, 3-0-0). (★3.).

E E 629. *Advanced Topics in Power Systems.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 631. *Active Networks.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 632. *Solid State Circuit Design.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 635. *Logical Design of Digital Computers.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 639. *Advanced Topics in Electronics.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 641. *High Vacuum Technology.* ☐ 3.8 (either term, 3-0-3/2). (★3.)

E E 642. *Special Topics Using High Vacuum Technology.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 645. *Selected Laser Topics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 649. *Advanced Topics in Lasers.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 651. *Network Synthesis I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 652. *Network Synthesis II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 655. *Introduction to Modern Control Theory.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 656. *Statistical Communications.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 657. *Advanced Communication Theory.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 659. *Advanced Topics in Controls.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 660. *Optimal Control Systems.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 662. *Discrete Data Control Systems I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 663. *Discrete Data Control Systems II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 665. *Biosystems Modelling and Analysis.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 666. *Nonlinear Systems Theory.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 668. *Sensory Communications.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 669. *Advanced Topics in Biomedical Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 670. *Electromagnetic Theory.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 671. *Electromagnetic Waves.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 672. *Electron Dynamics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 675. *Principles of Particle Accelerators.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 679. *Advanced Topics in Accelerators.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 680. *Microwave Measurements and Techniques.* ☐ 2.8 (Second Term, 2-0-3/2). (★3.)

E E 681. *Semiconductor Microwave Electronics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 682. *Microwave Circuit Theory.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 689. *Advanced Topics in Microwaves.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 693. *Elements of Plasma Theory.* ☐ 3.0 (First Term, 3-0-0). (★3.)

E E 694. *Advanced Topics in Plasma Theory.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 695. *Plasma Devices and Diagnostics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

E E 699. *Advanced Topics in Plasma.* ☐ 3.0 (either term, 3-0-0). (★3.)

E E 900. *Non-Thesis Project.* ☐ Variable (Variable). (★Variable.)

84.5 *Engineering, General*

ENGG 200. *Orientation to the Engineering Profession.* ☐ 2.0 (First Term, 2-0-0). An outline of the development and history of the engineering profession; the branches of engineering; the work of the engineer in the various branches. The course will consist basically of presentations from practitioners drawn from the various branches of engineering. Several written assignments will be required, which will form the basis for an assessment of the student's proficiency in report writing. (★2.)

ENGG 210. *Engineering Graphics.* ☐ 3.5 (either term, 2-0-3). Sketching, drafting and interpretation of pictorials and multiviews of three-dimensional objects; visual design; introduction to scales, sectioning; dimensioning. (★3.) Note: students in all sections of this course will write a common final examination.

ENGG 230. *Engineering Statics I.* ☐ 4.0 (either term, 3-0-2). Equilibrium of planar systems. Analysis of statically determinate trusses and frames. Friction. Virtual work. Three-dimensional equilibrium. Corequisite: MATH 212. (★3.) Note: students in all sections of this course will write a common final examination.

ENGG 231. *Engineering Statics II.* ☐ 3.0 (either term, 2-0-2). Centroids and centers of gravity. Forces in beams and cables. Force and moment diagrams. Distributed forces. Fluid Statics. Second moments of area. Prerequisites: ENGG 230 and MATH 212. (★3.) Note: students in all sections of this course will write a common final examination.

ENGG 305. *Engineering and Society.* ☐ 3.0 (Second Term, 3-0-0). An interpretative course on the art and science of engineering. Historical perspective. Basic concepts and techniques, including energy, equilibrium, decision-making, feedback, optimization. Examples of engineering design and analysis drawn from current societal problems in the areas of energy resources and environmental protection. Note: This course is offered for students registered in faculties other than the Faculty of Engineering. (★3.)

ENGG 420. *Engineering Law.* ☐ 3.0 (either term, 3-0-0). Contracts; specifications; agreements, industrial relations, labor laws, Workers' Compensation Act; building trades Protection Act, company law. The engineer as an expert witness; patents and inventions; trade marks; registered designs; copyrights. Note: Restricted enrolment. Registration approval by Dean's office only. (★3.)

ENGG 500. *The Practice of the Engineering Profession.* ☐ 1.0 (Second Term, 1-0-0). The technical and professional duties and responsibilities of the engineer, the ethics of the engineering profession, technical and professional organizations. The role of the engineer in the social environment. Note: Registration in this course is normally open only to those students in their final two terms. (★1.)

84.6 *Mechanical Engineering*

84.6.1 UNDERGRADUATE COURSES

MEC E 350. *Engineering Mechanics: Dynamics.* ☐ 3.0 (either term, 3-0-0). Moments of inertia. Kinematics and kinetics of rigid body motion, energy and momentum methods for plan motion, impact, mechanical vibrations. Prerequisites: ENG 230, 231 and MATH 213. (★3.)

MEC E 360. *Engineering Design.* ☐ 3.5 (Second Term, 2-0-3 Introduction to principles of design. Analysis and design components: joints, springs, flywheels, brakes, clutche Design as a decision making process. Prerequisite: CIV E 36 (★3.)

MEC E 402. *Mechanical Measurements.* ☐ 4.5 (First Term, 3-0-3). Characterization and behavior of typical measuring systems. Transducers and their response to steady and transient phenomena. Selected experiments in various fields of mechanical engineering to illustrate typical measurement situations. Prerequistes: CIV E 360 and MATH 213; corequiste: MEC E 431. (★3.)

MEC E 403. *Mechanical Engineering Laboratory I.* ☐ 2.5 (Second Term, 1-0-3). Selected laboratory experiments in applied mechanics and thermosciences. Prerequisite: MEC E 402. (★3.)

MEC E 412. *Operations Engineering.* ☐ 3.0 (Second Term, 2-0-2). The measurement and utilization of data by the engineer in industry. Types of data, effectiveness of data, models and methods of data collection, activity sampling, acceptance sampling, control charts. Prerequisite or corequisite: MEC E 402. (★3.)

MEC E 413. *Engineering Evaluation.* ☐ 3.0 (First Term, 3-0-0). The application of the fundamentals of economics to engineering alternatives in planning, developing and managing industrial projects. (★3.)

MEC E 431. *Fluid Mechanics I.* ☐ 3.5 (First Term, 3-0-1). Basic equations, hydrostatics. Bernoulli equation. Momentum theories, similitude, fluid metering, fluid friction in pipes. Compressible flow, boundary layers. Prerequiste: CH E 324. (★3.)

MEC E 440. *Applied Thermodynamics.* ☐ 3.0 (Second Term, 3-0-0). Thermodynamic analysis of cycles and propulsion systems applicable to engines, steam and gas turbines, elementary rockets, refrigeration, principles of combustion. Heat balance problems. Prerequisite: CH E 324. (★3.)

MEC E 450. *Vector Dynamics.* ☐ 3.0 (Second Term, 3-0-0). Kinematics of rigid bodies in three dimensions. Moments of inertia, equations of motion for a body, engineering applications. Prerequisite: MEC E 350. (★3.)

MEC E 460. *Machine Components.* ☐ 3.8 (Second Term, 3-0-3/2). Theories of failure, fatigue, stress concentration, contact stress. Design of welded structures, power screws, spur gears, worm gears. Study of rolling element bearings. Prerequisite: MEC E 360. (★3.)

MEC E 461. *Mechanics of Machines.* ☐ 2.8 (First Term, 2-0-3/2). Velocities and acceleration in plane mechanisms. Balancing of rotating and reciprocating machinery. Gears and gear trains. Prerequisite: MEC E 350. (★3.)

MEC E 464. *Manufacturing Processes.* ☐ 2.8 (Second Term, 2-0-3/2). Primary and secondary processes in metal forming. Material removal and fabrication techniques. Selected field trips and laboratory and shop exercises. Prerequisite: MEC E 360. (★3.)

MEC E 465. *Environmental Factors in Mechanical Engineering Design.* ☐ 3.0 (Second Term, 3-0-0). Properties of atmospheric environment important for engineering design and human comfort. Design considerations for extreme environments, dispersion and control of air pollution from stationary and mobile sources, thermal pollution. Noise control. Government legislation. Prerequisite: CH E 324. (★3.)

MEC E 470. *Heat Transfer.* ☐ 4.0 (Second Term, 3-2s-0). Mechanisms of heat transfer, steady and unsteady heat conduction. Thermal radiation, free and forced convection, heat exchanger selection. Prerequisite: MEC E 431. (★3.)

MEC E 471. *Transport Processes.* ☐ 3.0 (Second Term, 3-0-0). For Engineering students other than Mechanical Engineering students. Introduction to fluid mechanics, heat transfer, conduction, convection and thermal radiation. Prerequisites: CH E 324, MATH 317 and PHYS 331. (★3.)

MEC E 481. *Advanced Strength of Materials I.* ☐ 3.0 (First Term, 3-0-0). Review of analysis of beams and trusses; deflections of beams and trusses; analysis of statically indeterminate structures; application of methods to buildings, bridges, machine support structures and aircraft structures. Prerequisites: CIV E 360 and MATH 312. (★3.)

MEC E 490. *Development of Mechanical Engineering.* ☐ 2.0 (First Term, 2-0-0). The historical development of technology in western civilization: pre-industrial era; post-industrial era. The evolution of mechanical engineering devices and techniques during the last two centuries. Technology assessment: economic, ecological and social impact of technology in western civilization. The past, present and future role of mechanical engineering in Canada. (★3.)

MEC E 501. *Engineering Design.* ☐ 1.0 (First Term, 1-0-0). Selected guest lecturers on design problems in engineering. (★1.)

MEC E 503. *Mechanical Engineering Laboratory II.* ☐ 2.5 (First Term, 1-0-3). Selected laboratory experiments in applied mechanics and thermosciences. Prerequisite: MEC E 402. (★3.)

MEC E 512. *The Design and Implementation of Production Systems.* ☐ 3.5 (First Term, 3-1s-0). Organizational structure, the design and layout of new facilities, the expansion and modernization of existing facilities and the determination of plant location and size. Prerequisite: MEC E 413. (★3.)

MEC E 513. *The Scheduling and Control of Production Systems.* ☐ 3.5 (Second Term, 3-1s-0). The determination and the design of records of performance for administrative control of a manufacturing enterprise; operational problems of production systems including production orders, schedules, inventory control, and manpower requirements. Prerequisite: MEC E 512. (★3.)

MEC E 522. *Power Plant Engineering.* ☐ 3.0 (First Term, 3-0-0). Economics, design, and equipment of modern power stations and systems. Prerequisite: CH E 324. (★3.)

MEC E 523. *Principles of Heating and Air Conditioning.* ☐ 3.5 (Second Term, 3-1s-0). A study of the requirements for comfort conditions in commercial and industrial buildings; the calculation of heating and cooling loads, the characteristics of systems and systems components. Prerequisites: CH E 324 and MEC E 431. (★3.)

MEC E 531. *Fluid Mechanics II.* ☐ 3.0 (Second Term, 3-0-0). Laminar and turbulent flow theory, lubrication, ideal flow theory. Boundary layers and separation, cavitation, aerodynamics. Prerequisite: MEC E 431. (★3.)

MEC E 537. *Aerodynamics.* ☐ 3.0 (First Term, 3-0-0). Boundary layer flow, vorticity, circulation and aerodynamic lift, wing theory, aeronautical applications. Prerequisite: MEC E 431. (★3.)

MEC E 541. *Combustion Engines.* ☐ 3.0 (First Term, 3-0-0). History of basic cycles; air standard analysis of cycles; combustion theory including stoichiometry, flame temperatures and propagation, and engine knock; cycles analysis with deviations from ideal cycles and performance characteristics; fuels; design and operation of carburation and injection processes; exhaust emissions measuring techniques, identification of design parameters and their effect on emissions. Prerequisite: CH E 324. (★3.)

MEC E 543. *Energy Conversion.* ☐ 3.0 (Second Term, 3-0-0). Sources, flow and overall efficiency of use of various energy forms in society; thermodynamic analysis of new energy conversion devices including thermoelectric and magnetohydrodynamic generators, solar and fuel cells; new sources of energy from fission and fusion reactors as well as effects of these systems on overall energy system. Prerequisite: CH E 324. (★3.)

MEC E 550. *Vibrations and Sound.* ☐ 3.5 (First Term, 3-1s-0). Free and forced vibration of single degree of freedom systems with and without damping, vibration isolation. Free vibration of two degrees of freedom lumped mass systems; vibration absorption; beam vibrations. Sound waves, sound sources; subjective aspects of noise. Prerequisites: MEC E 350 and MATH 413 or CH E 476.

MEC E 552. *Advanced Vibrations.* ☐ 3.0 (Second Term, 3-0-0). Free vibration of lumped mass systems with many degrees of freedom and of continuous systems; modal analysis for forced vibrations, free and forced vibrations of chainlike systems. Application of computer to vibration problems. Prerequisite: MEC E 550.

MEC E 553. *Acoustic and Noise Control.* ☐ 3.0 (Second Term, 3-0-0). Acoustic waves, sound transmission through walls and structures. Acoustics of large and small rooms, mechanisms of sound absorption. Design of silencers. Prerequisites: MEC E 550 and MATH 413. (★3.)

MEC E 560. *Mechanical Systems Design.* ☐ 4.0 (Second Term, 3-0-2). Advanced machine design: lubrication, shaft vibration. Systems: reliability theory, optimization methods, applications of PERT and CPM. Prerequisites: MEC E 460 and 461. (★3.)

MEC E 561. *Design Project.* ☐ 2.5 (Second Term, 0-0-5). Selected design projects requiring the student to exercise creative ability, to make assumptions and decisions, and in general, devise new designs, rather than analyse existing ones. Corequisite: MEC E 560. (★3.)

MEC E 570. *Advanced Heat Transfer.* ☐ 3.0 (Second Term, 3-0-0). Advanced topics in conduction, convection and thermal radiation heat transfer with special emphasis on analytical and numerical solution techniques applied to engineering problems. Prerequisites: MEC E 470 and MATH 413. (★3.)

MEC E 584. *Advanced Strength of Materials II.* ☐ 3.0 (First Term, 3-0-0). Special topics for beams. Torsion, pressure vessels, circular and rectangular plates, stability, fracture mechanics. Prerequisites: CIV E 360 and MATH 413 or CH E 476. (★3.)

84.6.2 GRADUATE COURSES

MEC E 601. *Graduate Seminar.* ☐ 0.5 (0-1s-0). (★0.5.)

MEC E 605. *Experimental Strain Analysis.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 610. *Engineering Economic Analysis.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 611. *Quantitative Methods for Industrial Systems I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 612. *Quantitative Methods for Industrial Systems II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 613. *The Total Design of Operating Systems.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 620. *Combustion.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 628. *Reading Projects in Advanced Applied Thermodynamics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 629. *Reading Projects in Advanced Applied Thermodynamics.* ☐ 6.0 (3-0-0). (★6.)

MEC E 630. *Introduction to Viscous Flow.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 632. *Turbulent Fluid Dynamics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 635. *Gas Dynamics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 638. *Reading Projects in Advanced Fluid Dynamics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 639. *Reading Projects in Advanced Fluid Dynamics.* ☐ 6.0 (3-0-0). (★6.)

MEC E 640. *Analytical Thermodynamics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 648. *Reading Projects in Advanced Thermodynamics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 649. *Reading Projects in Advanced Thermodynamics.* ☐ 6.0 (3-0-0). (★6.)

MEC E 650. *Analytical Dynamics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 652. *Nonlinear Oscillations.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 655. *Dynamics of Structures.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 658. *Reading Projects in Advanced Dynamics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 659. *Reading Projects in Advanced Dynamics.* ☐ 6.0 (3-0-0). (★6.)

MEC E 660. *Design of Mechanical Systems I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 661. *Design of Mechanical Systems II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 664. *Techniques of Mechanical Design.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 670. *Advanced Heat Transfer.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 671. *Laminar Convection.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 672. *Thermal Radiation.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 678. *Reading Projects in Advanced Heat Transfer.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 679. *Reading Projects in Advanced Heat Transfer.* ☐ 6.0 (3-0-0). (★6.)

MEC E 680. *Continuum Mechanics.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 681. *Elasticity.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 682. *Plasticity.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 683. *Plates and Shells.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MEC E 684. *Static and Dynamic Stability.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 685. *Macro Fracture Mechanics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MEC E 688. *Reading Projects in Advanced Solid Mechanics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MEC E 689. *Reading Projects in Advanced Solid Mechanics.* ☐ 6.0 (3-0-0). (★6.)

MEC E 900. *Non-Thesis Project.* ☐ 6.0 (Variable). (★6.)

84.7 Mineral Engineering

84.7.1 UNDERGRADUATE COURSES

MNL E 351. *Materials Science I.* ☐ 3.0 (either term, 3-0-0). An introduction to the science of materials from the standpoint of the relationships between structure and physical and mechanical properties. Atomic bonding, crystal structure and crystal imperfections, binary phase equilbria and phase transformations. Structures of metallic, non-metallic and composite materials. Elastic and plastic deformation, fracture, fatigue and creep in crystalline and amorphous solids. Corrosion and thermal stability of materials in service. Prerequisite: CHEM 205 or consent of Department. (★3.)

MNL E 352. *Materials Science II.* ☐ 3.8 (either term, 3-0-3/2). An introduction to the science of materials relating their mechanical, thermal electronic and chemical properties to atomic, molecular and crystal structure. Ceramic and metallic crystals, glasses, polymers and composite materials. Multi-phase materials, strengthening processes. Laboratories include mechanical properties of metals and polymers, microstructure, heat treatment of steel corrosion. Prerequisite: CHEM 205. (★3.)

MNL E 354. *Materials Science III.* ☐ 2.8 (First Term, 2-0-3/2). The structures of solid materials. Atomic bonding, crystal structure and crystal imperfections, fundamentals of x-ray diffraction, polymer and silicate structures. Binary phase equilibria, phase changes, nucleation, and non-equilibrium reactions in solids. The effect of heat treatment and other strengthening mechanisms on the structure of metals. Prerequisite: CHEM 205. (★3.)

MNL E 355. *Materials Science IV.* ☐ 2.8 (Second Term, 2-0-3/2). The properties of materials as related to their structures. Mechanical behavior, including mechanical tests, elasticity of crystalline and non-crystalline materials, elementary dislocation theory, plastic deformation, and fracture. Chemical properties: oxidation of metals and the electrochemical theory of aqueous corrosion. Electronic properties based on the energy band theory of solids. Thermal and electrical conduction, semiconduction, dielectric behavior and magnetism. Prerequisite: MNL E 354. (★3.)

MNL E 390. *Introduction to Mineral Engineering.* ☐ 2.8 (Second Term, 2-0-3/2). An introduction to the exploration, production and processing of minerals including metallic minerals, industrial minerals, coal, oil sands, petroleum and natural gas. (★3.)

MNL E 401. *Mine Plant Engineering.* ☐ 3.8 (First Term, 3-0-3/2). Analysis of mine plant elements with emphasis on design; mining machinery and power requirements, transmission, application and control; mechanical power transmission; compressors and air distribution systems, pumps and dewatering systems, fan systems. Selection, installation, operation and maintenance of mining equipment. Prerequisite: E E 301 or consent of instructor. (★3.).

MNL E 406. *Principles of Mine Ventilation.* ☐ 2.8 (Second Term, 2-0-3/2). Mine ventilation, gases and dusts, humidity and heat, mechanics of air flow, ventilation circuits and fans, safety standards and practices. (★3.).

MNL E 410. *Mine Economics and Organization.* ☐ 3.0 (Second Term, 3-0-0). Evaluation of ore deposits, markets, production costs, cash flow, taxation and estimates of profitability; financial and organization structures of mining companies; financial planning and management functions. Prerequisite: MNL E 41[illegible] and 495 or consent of instructor. (★3.).

MNL E 416. *Mineral Deposits and Exploration.* ☐ 4.5 (First Term, 3-0-3). Metalliferous deposits, economic mineral associations, morphology, mining exploration including prospecting applications of geophysics and geochemistry, sampling prospect drilling. Principles of mine development including general layouts and selection of methods. Laboratory exercises in preparing mine plans and calculation of ore tonnages and grades. Prerequisite: MNL E 390 or consent of instructor. (★3.)

MNL E 422. *Rock Structures and Intact Rock Properties.* ☐ 3.[illegible] (First Term, 3-0-3/2). Rock texture and fabric; compaction, fracture and deformation properties, effect of environment and time, strength theories. State of stress in the Earth's crust and its measurement. Formation, geometry and classification of depositional, diastrophic and non-diastrophic structures including bedding, jointing, faulting, folding, cleavage

Representation of structures on maps and stereographic projections. Prerequisite: CIV E 360 or consent of instructor. (★3.)

MNL E 423. *Rock Mechanics.* ☐ 3.8 (Second Term, 3-0-3/2). Mechanical properties of rock masses, field and laboratory determination; classification and index testing; permeability and flow; stresses around underground openings, elastic prototypes and numerical methods; ground support principles and mechanics of common support systems, loads on supports; hydraulic backfill, earth pressures, consolidation theory and practical consequences in mining; mechanics of subsidence and caving; rockburst mechanics; slope stability, rock mechanics instrumentation. Prerequisite: CIV E 360 or consent of instructor. (★3.)

MNL E 424. *Rock Fragmentation.* ☐ 2.0 (Second Term, 2-0-0). Rock dynamics; blasting theories; explosives; design of rounds; controlled blasting; vibrations; fragmentation without explosives; drilling. Prerequisite: CIV E 360. (★2.)

MNL E 430. *Mine Transport and Materials Handling.* ☐ 3.8 (Second Term, 3-0-3/2). Objectives of materials handling; surface and underground haulage, unit and continuous methods; hoists and hoisting systems; transfer and blending techniques; hydraulic pipelining; analysis of materials handling systems. (★3.).

MNL E 431. *Mineral Processing I.* ☐ 4.5 (First Term, 3-0-3). Unit operations employed to concentrate minerals including comminution, classification, gravity concentration, froth flotation, thickening, filtering; tailings disposal; marketing of minerals; economics. Prerequisite: MNL E 390 or consent of instructor. (★3.)

MNL E 432. *Pyrometallurgy.* ☐ 3.8 (Second Term, 3-0-3/2). Nature of ores, furnaces, fuels, slags, mattes and refractories. Metallurgical calculations. Metallurgical unit processes involving the use of elevated temperatures to extract metals including calcining, roasting, reduction, distillation, smelting, converting, refining and casting. Metals discussed include iron and steel, lead, zinc, titanium, tin and copper. Prerequisite: MNL E 440. (★3.)

MNL E 435. *Extractive Metallurgy.* ☐ 2.8 (Second Term, 2-0-3/2). Fundamentals and applications of pyrometallurgical, hydrometallurgical and electrometallurgical processes used to win metals from their ores and concentrates. Prerequisite: MNL E 431, or consent of instructor. (★3.)

MNL E 440. *Metallurgical Thermodynamics and Kinetics.* ☐ 3.0 (First Term, 3-0-0). Application of thermodynamics and kinetics to problems in extractive and solid-state metallurgy. Review of thermodynamic variables and mathematical prerequisites. Solution thermodynamics applied to metallurgical reduction and refining processes, phase equilibria. Experimental methods and estimation of thermochemical data, kinetics of homogeneous and heterogeneous metallurgical processes; formal basis of diffusion theory. Prerequisite or corequisite: CHEM 370. (★3.)

MNL E 450. *Physical Metallurgy.* ☐ 3.8 (First Term, 3-0-3/2). The physical metallurgy of engineering alloys, composition, heat treatment and engineering properties of steels, cast irons and selected non-ferrous alloys. Materials selection. Metallurgy of welding and joining. Prerequisite: MNL E 352. (★3.)

MNL E 457. *Fundamentals of Physical Metallurgy I.* ☐ 4.5 (First Term, 3-0-3). Elements of crystallography. Stereographic projection, x-ray diffraction, structure of alloys, crystal defects. Diffusion. Phase equilibria and transformations. Prerequisite: MNL E 351 or 352 or 355. (★3.)

MNL E 458. *Fundamentals of Physical Metallurgy II.* ☐ 4.5 (Second Term, 3-0-3). Elastic deformation. Dislocation theory, plastic deformation of crystals, strengthening mechanisms, annealing behavior. Fracture, creep and fatique processes. Prerequisite: MNL E 457. (★3.)

MNL E 462. *Petroleum Reservoir Fluids.* ☐ 3.5 (First Term, 3-1s-0). Origin, accumulation, composition, nature and behavior of petroleum reservoir fluids. Prerequisite: CHEM 370 or CH E 324, or consent of instructor. (★3.)

MNL E 464. *Oil Well Drilling and Completion.* ☐ 3.5 (First Term, 3-1s-0). Elements of rock mechanics, drilling fluids, factors affecting rate of penetration, formulation evaluation and well completions. Prerequisites: CIV E 360 and either CHEM 370 or CH E 324, or consent of instructor. (★3.)

MNL E 466. *Petroleum Production Operations.* ☐ 3.0 (Second Term, 3-0-0). Types and characteristics of well completions, elementary theory of reservoir flow, flow through conduits, flow measurement and control, artificial lift, fluid separation treatment and disposal, design of gathering lines and production facilities, well-testing simulation and recompletion, reserves estimation and decline curve analysis. Prerequisites: MNL E 462 and 464. (★3.)

MNL E 495. *Statistical Methods for Mineral Engineers.* ☐ 2.5 (First Term, 2-1s-0). Engineering statistics including experimental design, data analysis and sampling theory, with emphasis on mineral engineering applications. Prerequisite: MATH 213. (★3.)

MNL E 499. *Mineral Seminar I.* ☐ 0.5 (First Term, 0-1s-0). Special lectures and discussions on topics of interest in mining, mineral process, metallurgical and petroleum engineering. (★1.)

MNL E 502. *Mine Design I.* ☐ 3.0 (Second Term, 0-0-6). Planning of the exploration, surface and/or underground layout and operation of a mine. Students work in groups, select a problem involving a mineral deposit, prepare plans, schedules for its development. Results are to be submitted in a report, complete with drawings, specifications and cost estimates. Prerequisites: MNL E 513 and 514. (★3.)

MNL E 505. *Mine Project and Contract Management.* ☐ 3.0 (either term, 3-0-0). The theory and practice of mine project and contract management including financing, government regulations, organization of the operational unit, and operational analysis. Applied statistics probability and programming for mine operations. Prerequisite: MNL E 410 or consent of instructor. (★3.).

MNL E 507. *Mine Safety.* ☐ 2.8 (Second Term, 2-0-3/2). Physiological effects of: dusts of coal, silica, asbestos, heat, humidity and gases in underground mines. Control and dilution of mine dusts and gases. Hazards of underground gas and dust explosions, prevention and safety procedures, and inundation of water. Effects of radiation in mines, noise and mine illumination on the mine environment. Prerequisite: MNL E 524. (★3.).

MNL E 508. *Mine Environmental Planning.* ☐ 3.0 (either term, 3-0-0). Mining planning, development and exploitation of mineral deposits as influenced by (1) disposal of waste rock, (2) engineering and design of tailings dams, (3) reclamation and revegation of mine spoil, (4) mine drainage and pollution control case studies. Prerequisite: MNL E 524 or consent of instructor. (★3.).

MNL E 513. *Surface Mining.* ☐ 3.8 (First Term, 3-0-3/2). Planning of surface mines including pit designs; equipment selection and control of operations; optiminization of financial returns; land conservation and reclamation. Prerequisites: MNL E 416 and 422. (★3.).

MNL E 514. *Underground Mining Methods.* ☐ 3.8 (First Term, 3-0-3/2). A study of various mining methods involving particular references to economic optiminization in both design and production. In addition to conventional mining methods new, under review mining systems are also analyszed, particularly for large scale mining. Development and production costs associated with mining methods is an inherent aspect of this course. Prerequisite: MNL E 352. (★3.).

MNL E 516. *Mine Development and Explosives.* ☐ 3.0 (First Term, 3-0-0). Environmental conditions, models of underground openings and development, shafts, inclines and ramps, horizontal openings, boring technique, interaction between openings, planning of mine openings, costs, safety and environmental requirements. Prerequisite: MNL E 416. (★3.)

MNL E 518. *Coal Mining Methods.* ☐ 3.0 (either term, 3-0-0). Technical consideration of factors which affect and constrain choice of mining methods. Engineering design of the elements of mine structures. Mining methods for flat, gently dipping, pitching and steep desposits, with reference to seam thickness. Factor studies are: coal getting, natural and artificial support, mechanization, coal recovery and conservation. Prerequisite: MNL E 512 or consent of instructor. (★3.).

MNL E 519. *Coal Mining and Processing.* ☐ 3.8 (Second Term, 3-0-3/2). Nature of coal deposits; physical and chemical properties; exploration and evaluation; mining, coal processing and conversion; economics and utilization. (This course is intended for senior students in Mineral Engineering and Geology.) (★3.)

MNL E 527. *Practical Experience and Report.* ☐ 1.0. Before being granted the degree, students must satisfy the Department that they have had at least six months practical experience in mining, metallurgy or geological field work. A suitable report on practical experience must be submitted to the Department *not later* than December 1 of the fourth year. (★1.)

MNL E 528. *Mining Field Trip.* ☐ 0.0. An extended trip to visit mining and metallurgical plants is made every second year by Third- and Fourth-Year Mining, Mineral and Metallurgy students accompanied by staff. Fourth-Year students in Mining and Mineral Engineering may also be required to make several part-day trips during the session to mining, metallurgical and other industrial plants near Edmonton. Prerequisite: MNL E 390. (★0.)

MNL E 529. *Mineral Seminar.* ☐ 1.0 (Second Term, 1-0-0). Meetings of students and staff for discussion of topics related to mining engineering. (★1.)

MNL E 530. *Hydrometallurgy and Electrometallurgy.* ☐ 3.8 (First Term, 3-0-3/2). Principles and applications of hydrometallurgical and electrometallurgical processes to extract metals: atmospheric and pressure leaching, ion exchange, solvent extraction, hydrogen reduction, electrowinning and electrorefining. Metals discussed include copper, nickel, cobalt, uranium, zinc, aluminum and magnesium. Prerequisite: MNL E 440. (★3.)

MNL E 533. *Mineral Processing II.* ☐ 3.8 (First Term, 3-0-3/2). The analysis, optimization and control of mineral processing systems through mathematical modelling and digital simulation. Instrumentation and control of mineral processing plants. Prerequisites: MNL E 431 and 495. (★3.)

MNL E 535. *Origins, Formation and Properties of Coal.* ☐ 3.0 (First Term, 3-0-0). Conditions for formation and metamorphic development of coal. The Coal "series". Coal compositions. Mineral matter in coal. Physical and chemical properties of coal, with emphasis on properties bearing on coal storage, transportation and end-uses (including gasification and liquefaction). Prerequisite: MNL E 352. (★3.)

MNL E 540. *Metallurgical Research Project I.* ☐ 1.5 (First Term, 0-0-3). Research on current topics in metallurgical and mineral engineering, including physical, chemical and mechanical metallurgy, and mineral processing. Literature survey on a specific topic and submission of a detailed research proposal. Corequisite: MNL E 599. (★2.)

MNL E 541. *Metallurgical Research Project II.* ☐ 3.0 (Second Term, 0-0-6). Execute research according to research proposal prepared in MNL E 540. Write research report. Prerequisite: MNL E 540. Corequisite: MNL E 549. (★3.)

MNL E 542. *Metallurgical Plant Design and Operation.* ☐ 3.5 (First Term, 2-0-3). Fundamental concepts of design, flowsheet layout, cost estimation, profitability analysis, equipment sizing and selection, maintenance scheduling and operating practices. Prerequisite: MNL E 431. (★3.)

MNL E 543. *Special Topics in Metallurgy.* ☐ 3.0 (either term, 3-0-0). Physical and chemical principles underlying metallurgical topics of current interest such as composite materials, materials problems in energy conversion, electrofinishing, recycling, extraction of metals from fossil fuels, iron and steelmaking , and refractory-slag interactions. (★3.)

MNL E 545. *Corrosion and Oxidation.* ☐ 3.0 (Second Term, 3-0-0). Electrochemical theory of galvanic attack, concentration cells and differential temperature cells. Uniform attack. The interaction of mechanical stresses and corrosion. Selection of corrosion-resistant materials. Protective coatings, inhabitors and cathodic protection, corrosion testing, high-temperature oxidation and other gas-metal reactions. Prerequisite: MNL E 352 or 355. (★3.)

MNL E 548. *Metallurgical Field Trip.* ☐ 0.0. An extended trip to visit mining and metallurgical plants is made every second year by Third- and Fourth-Year Mining, Mineral Processing and Metallurgy students accompanied by staff. Fourth-Year students in Metaliurgy may also be required to make several part-day trips during the session to mining, metallurgical and other industrial plants near Edmonton. Prerequisite: MNL E 390. (★0.)

MNL E 549. *Metallurgical Seminar.* ☐ 1.0 (Second Term, 1-0-0). Meetings of staff and fourth-year students for discussion of topics from recent literature related to metallurgical research. Prerequisites: MNL E 432 and 457. (★1.)

MNL E 552. *Applications of Physical Metallurgy I.* ☐ 3.8 (First Term, 3-0-3/2). Service conditions, mechanical properties and materials selection of engineering alloys. Composition, structure, heat treatment and properties of alloys including steels, tool and die materials, refractory metals, and light metal alloys. Metallurgical design. Prerequisite: MNL E 457. (★3.)

MNL E 553. *Applications of Physical Metallurgy II.* ☐ 3.8 (Second Term, 3-0-3/2). Solidification processing, deformation processing. Metal working by forging, rolling and drawing. Powder metallurgy. Metallurgy of welding and joining. Prerequisite: MNL E 552 or 450. (★3.)

MNL E 555. *Special Topics in Metal Processing.* ☐ 3.0 (Second Term, 3-0-0). Studies of the metallurgical background of specific metal processing techniques which are of current interest. Prerequisite: MNL E 552 or 450. (★3.)

MNL E 564. *Well Logging and Formation Evaluation.* ☐ 3.0 (Second Term, 3-0-0). Theory and engineering applications of measurements of physical properties of the formation near the well bore; interpretation and use of the information in reservoir engineering. Prerequisite: MNL E 462, or consent of instructor. (★3.)

MNL E 568. *Heavy Oil Recovery.* ☐ 3.0 (First Term, 3-0-0). The objectives of this course are to introduce the student to the current heavy oil recovery technology, and to develop the practical project design techniques. Emphasis will be on thermal methods, although nonthermal methods will be covered briefly. This is designed to be suitable for both undergraduate and graduate students. Pre- or corequisite MNL E 573. (★3.).

MNL E 573. *Fundamental Reservoir Engineering.* ☐ 3.8 (First Term, 3-0-3/2). Rock properties, rock-fluid interaction, flow through porous media; material balance. Prerequisite: MNL E 462 or consent of instructor. (★3.)

MNL E 575. *Applied Reservoir Engineering.* ☐ 3.5 (Second Term 3-1s-0). Analysis and prediction of reservoir performance by use of material balance, steady and unsteady state flow equations. Prerequisite: MNL E 573. (★3.)

MNL E 577. *Modelling in Petroleum Engineering.* ☐ 3.0 (Second Term, 3-0-0). Fundamentals of Modelling in Petroleum Engineering. Simulation methods as applied to specific problems in petroleum reservoir behavior. Examples will be drawn from primary, secondary and tertiary recovery phases of petroleum production. Prerequisites: MNL E 573, CMPUT 301 and MATH 312 or equivalent. (★3.)

MNL E 584. *Petroleum Engineering Design.* ☐ 3.5 (First Term 2-0-3). A design problem in petroleum engineering involving exploration, drilling, production and development fundamentals and field case histories, Canadian oil and gas regulations, conservation of petroleum by control of production, unitization and equalization of investment. (★3.)

MNL E 588. *Petroleum Field Trip.* ☐ 0.0. Students in their final two terms will be required to make several trips to selected field installations, laboratories and industrial plants. (★0.)

MNL E 589. *Petroleum Seminar.* ☐ 1.0 (Second Term, 1-0-0). Meeting of students and staff for discussion of topics related to petroleum engineering. (★1.)

MNL E 596. *Case Studies in Mineral Engineering.* ☐ 2.5 (either term, 1-3s-0). Designed to deal with special case studies in the Mining and Petroleum industries; an analysis of reserves, the prediction of production and operating procedures related to the project; the application of economics in the analysis of profitability; economics and planning as tools for a management position. Prerequisite: MNL E 584 or consent of the instructor. (★3.)

MNL E 597. *Operations Research.* ☐ 3.5 (First Term, 3-1s-0). Simulation, linear programming; network analysis; dynamic programming. (★3.)

MNL E 599. *Mineral Seminar II.* ☐ 0.5 (First Term, 0-1s-0). Special lectures and discussions on topics of interest in mineral engineering. (★1.)

84.7.2 GRADUATE COURSES

MET E 601. *Research Techniques in Metallurgy.* ☐ 3.5 (either term, 2-0-3). (★3.)

MET E 610. *Welding Metallurgy.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MET E 611. *Welding Processes.* ☐ 3.8 (First Term, 3-0-3/2). (★3.)

MET E 615. *Quality Control of Weldments.* ☐ 3.8 (either term, 3-0-3/2). (★3.)

MET E 630. *Special Topics in Process Metallurgy.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 640. *Special Topics in Metallurgical Thermodynamics and Kinetics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 645. *Electrochemical Processes.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 650. *Corrosion.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 660. *Metallurgical Applications of X-rays.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 661. *Metallurgical Application of the Electron Microscope.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 662. *Fracture of Metals.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 669. *Theory of Alloy Phases.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 675. *Crystal Lattice Imperfections and the Mechanical Behavior of Solids.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MET E 676. *Special Topics in Physical Metallurgy.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 680. *Ceramics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 900. *Non-Thesis Project.* ☐ 3.0 (Variable). (★3.)

MIN E 602. *Design Project I.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MIN E 603. *Design Project II.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MIN E 620. *Rock Mechanics.* ☐ 3.0 (either term, 3-0-0). (★3.)

MIN E 621. *Geomechanics of Underground Mining.* ☐ 3.0 (either term, 3-0-0). (★3.)

MIN E 622. *Surface Mining.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MIN E 650. *Special Topics in Mining Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

MIN E 900. *Non-Thesis Project.* ☐ 3.0 (Variable). An engineering project course for students registered in a Master of Engineering program. (★3.)

PET E 612. *Porous Media.* ☐ 3.0 (First Term, 3-0-0). (★3.)

MNL E 623. *Oil Sands and Energy Resources Geomechanics* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MNL E 630. *Advanced Topics in Coal Preparation.* ☐ 3.0 (either term, 3-0-0). (★3.)

MNL E 635. *Coal Conversion and Utilization.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

MNL E 900. *Non-Thesis Project.* ☐ 3.0 (Variable). An engineering project course for students registered in a Master of Engineering program. (★3.)

PET E 614. *Well Logging and Formation Evaluation.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

PET E 630. *Petroleum Reservoir Engineering.* ☐ 3.0 (First Term, 3-0-0). (★3.)

PET E 632. *Advanced Topics in Petroleum Production Mechanics.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

PET E 634. *Secondary Recovery.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

PET E 635. *Numerical and Analytical Solution of Porous Media Flow Problems.* ☐ 3.0 (First Term, 3-0-0). (★3.).

PET E 644. *Fluid Mechanics of Natural Gas Production.* ☐ 3.0 (First Term, 3-0-0). (★3.)

PET E 650. *Resevoir Simulator Development.* ☐ 3.0 (Second Term, 3-0-0). (★3.).

PET E 682. *Graduate Seminar.* ☐ 0.5 (0-1s-0). (★1.)

PET E 684. *Oil and Gas Property Evaluation.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

PET E 694. *Advanced Topics in Petroleum Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

PET E 900. *Non-Thesis Project.* (Variable) (★3.)

84.7.3 READING COURSES

MET E 638. *Process Metallurgy.* ☐ 3.0 (either term, 3-0-0). (★3.)

MET E 678. *Physical Metallurgy.* ☐ 3.0 (either term, 3-0-0). (★3.)

MIN E 610. *Mining.* ☐ 3.0 (either term, 3-0-0). (★3.)

PET E 732. *Reservoir Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

PET E 734. *Secondary Recovery.* ☐ 3.0 (either term, 3-0-0). (★3.)

PET E 744. *Natural Gas Engineering.* ☐ 3.0 (either term, 3-0-0). (★3.)

84.8 Agricultural Engineering

84.8.1 UNDERGRADUATE COURSES

AG EN 301. *Heating, Ventilating and Air-Conditioning Agricultural Buildings.* ☐ 4.5 (First Term, 3-0-3). Environmental requirements as determined by physiological principles. Environmental control. (★3.)

AG EN 313. *Soil and Water Engineering.* ☐ 4.0 (First Term, 3-0-2). Basic principles of agricultural hydrology, soil-water relations, water resource development, water conservation practices. Formerly AG EN 408. Prerequisite: SOILS 310 recommended. Note: Not open to students with credit in AG EN 308. (★3.)

AG EN 413. *Irrigation and Drainage Engineering.* ☐ 4.5 (Second Term, 3-0-3). Irrigation and drainage principles; planning and design of irrigation and drainage systems. Prerequisite: CIV E 430. (★3.)

AG EN 420. *Analysis of Agricultural Systems.* ☐ 4.5 (First Term, 3-0-3). The application of mathematical programming methods to problems in agricultural systems. Prerequisite: MATH 243 or 312 or AG EC 316. Not open to students with credit in FOREN 420. (★3.)

AG EN 421. *Simulation Methods in Agricultural Engineering.* ☐ 4.5 (Second Term, 3-0-3). Use of analogue and digital computers to simulate agricultural processes (e.g., harvesting, fertilizing, seeding, ventilating, irrigating). Continuous and discrete simulation models are developed in group projects. Prerequisite: Introductory courses in computing science and calculus. Not open to students with credit in FOREN 421. (★3.)

AG EN 453. *Power Units.* ☐ 4.5 (First Term, 3-0-3). Energy conversion, power transmission, soil vehicle mechanics, hydraulic systems, tractor performance and evaluation, tractor dynamics. Prerequisites: CH E 324, CIV E 430 and MEC E 350. (★3.)

AG EN 454. *Agricultural Machinery.* ☐ 4.5 (Second Term, 3-0-3). The course uses the wedge theory and the Mohr-Coulomb failure criteria as a basis for a simple tillage theory. Various tillage tools are examined as well as implement and tractor chassis mechanics. An introduction to harvesting processes is made. Particle dynamics and mechanics of raking and cutting are developed. Harvesting systems are noted. Prerequisites: MEC E 350, CIV E 480. (★3.)

AG EN 456. *Post-harvest Technology.* ☐ 4.5 (First Term, 3-0-3). Forage conditioning, fractionation, watering, preservation; and silage, grain and forage dehydration, feeding and transport equipment, storage regimes cleaning, sorting and milling, conveying and metering, process control. Prerequisite: AG EN 301. (★3.)

AG EN 500. *Agricultural Engineering Field Trip.* ☐ 0.0. An extended trip to visit agricultural engineering operations is made every second year by Third- and Fourth-Year Agricultural Engineering students. (★0.)

AG EN 503. *Instrumentation in Agricultural Engineering.* ☐ 4.5 (First Term, 3-0-3). A study of the primary sensing elements used in agricultural engineering, their principles of operation and application. Prerequisites: CIV E 360, E E 302 and MEC E 350. (★3.)

AG EN 510. *Agricultural Engineering Project.* ☐ 3.0 (Second Term, 1-0-4). Each final year student in the B.Sc. (Agr. Eng.) program works independently on a project approved by the Coordinator. The project must be either a literature review or an engineering design problem or an experimental research project or a combination of any of these. Both a brief outline and a formal report must be submitted by the due dates. (★3.)

AG EN 552. *Advanced Irrigation and Drainage.* ☐ 3.5 (Second Term, 3-1s-0). Studies of selected topics or special problems in irrigation and drainage. Prerequisite: SOILS 470 or AG EN 313. (★3.)

AG EN 555. *Data Analysis and Processing.* ☐ 3.0 (Second Term, 3-0-3). Application of statistical techniques to experiments in agricultural engineering including dimensional analysis and curve fitting techniques. Data computation with graphical output. Prerequisites: CMPUT 351, STAT 241. (★3.)

84.8.2 GRADUATE COURSES

AG EN 600. *Agricultural Engineering Seminar.* ☐ 0.0 (0-1s-0). (★0.)

AG EN 602. *Selected Topics in Agricultural Mechanization.* ☐ 1.5 (either term, 1-2s-0) (★3.). or ☐ 3.0 (1-2s-0) (★6.)

AG EN 603. *Advanced Agricultural Buildings and Environment.* ☐ 1.5 (either term, 1-2s-0) (★3.) or ☐ 3.0 (1-2s-0). (★6.)

AG EN 604. *Advanced Farm Power and Machinery.* ☐ 3.0 (Second Term, 3-0-0). (★3.)

AG EN 605. *Project in Agricultural Machinery.* ☐ 1.5 (either term, 1-2s-0) (★3.) or ☐ 3.0 (1-2s-0). (★6.)

AG EN 606. *Advanced Soil and Water Engineering.* ☐ 1.5 (either term, 1-2s-0) (★3.) or ☐ 3.0 (1-2s-0). (★6.)

AG EN 910. *Non-Thesis Project.* ☐ 3.0 (variable). (★3.)

84.9 Courses Offered by Other Faculties

84.9.1 ARTS

ANTHROPOLOGY

ANTHR 202. *Man and Culture.* ☐ 6.0 (3-0-0). An introduction to anthropological thought concerning such topics as race, evolution, culture growth and culture change. Note: Not open to students with credit in ANTHR 306 or 307. (★6.)

ANTHR 306. *Introduction to Prehistory.* ☐ 3.0 (either term, 3-0-0). The nature, purposes, theory and methods of prehistory and its relation to anthropology as a whole. Note: Not open to students who have taken ANTHR 202. (★3.)

ANTHR 307. *Introduction to Social and Cultural Anthropology.* ☐ 3.0 (either term, 3-0-0). The comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics and political institutions and religion; processes of change. Note: Not open to students who have taken ANTHR 202. (★3.)

ANTHR 308. *Introduction to Linguistic Anthropology.* ☐ 3.0 (either term, 3-0-0). The anthropological study of language and communication. A brief survey of field and analytical methods and the theory of linguistic anthropology. (★3.)

ANTHR 309. *Introduction to Physical Anthropology.* ☐ 3.0 (either term, 3-0-0). Survey of theory and basic data in human evolution and human variation. Topics include primatology, osteology, hominoid paleontology, variation in modern populations. (★3.)

ANTHR 330. *Technology in Culture.* ☐ 3.0 (either term, 3-0-0). An anthropological introduction to the evolution of tools and techniques; the adaption of society to environment through technology; the interrelationship of technology, ideology and social organization. (★3.)

ART AND DESIGN

ART H 201. *Introduction to the History of Art I.* ☐ 3.0 (either term, 3-0-0). Introduction to European Art from the Middle Ages to the 17th Century by analysis of selected works and movements. (★3.)

ART H 202. *Introduction to the History of Art II.* ☐ 3.0 (either term, 3-0-0). Introduction to the art of the 17th, 18th, 19th and 20th Centuries by analysis of selected works and movements. (★3.)

ART H 250. *Survey of Western Art I.* ☐ 3.0 (either term, 3-0-0). A survey of Western art to the end of the Middle Ages. Note: Formerly part of ART 200; not to be taken by students with credit in that course of ART H 201. (★3.)

ART H 251. *Survey of Western Art II.* ☐ 3.0 (either term, 3-0-0). A survey of Western art from the beginning of the Renaissance to the present day. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 201. (★3.)

CLASSICS

CLASS 201. *Literature of Greece and Rome.* ☐ 3.0 (either term, 3-0-0). An introductory survey in English translation of Greek and Latin literature in its social, artistic and cultural background. A limited number of major works, representing the most important genres, will be studied. (★3.)

CLASS 202. *Greek and Roman Mythology.* ☐ 3.0 (either term, 3-0-0). A survey of classical mythology with readings in translation from various ancient authors as well as from modern scholarly works. Note: Formerly part of CLASS 240. (★3.)

CLASS 230. *Introduction to the Ancient Near East and Greece.* ☐ 3.0 (either term, 3-0-0). An introductory course in the history of the Ancient Near East and Greece from the Neolithic Age to the Fourth Century A.D. (★3.)

CLASS 231. *Introduction to Rome and the West.* ☐ 3.0 (either term, 3-0-0). An introductory course in the history of Rome and the western Mediterranean to the collapse of the Roman Empire. (★3.)

CLASS 241. *Ancient Science and Technology.* ☐ 3.0 (either term, 3-0-0). A survey of ancient science and technology in the Middle Eastern, Greek and Roman civilizations. (★3.)

CLASS 250. *The Greek World.* ☐ 3.0 (either term, 3-0-0). Greek life and society illustrated by archaeological discoveries; the Bronze Age, the city, temples. Athens, Sparta, Greek art and architecture, trade and warfare. Slides, films, other materials. (★3.)

CLASS 251. *The Roman World.* ☐ 3.0 (either term, 3-0-0). A study of Roman society illustrated by archaeological discoveries: city life, housing, town planning, games, trade, shipping, and the army. Slides, films, coins and other materials will be used. (★3.)

CLASS 260. *Greek and Latin Etymology.* ☐ 3.0 (either term, 3-0-0). A study of Greek and Latin words commonly used in English; how these words are built, and how they gain and change in meanings. (★3.)

COMPARATIVE LITERATURE

C LIT 201. *Introduction to World Literature I.* ☐ 3.0 (either term, 3-0-0). An analysis of a limited number of major works of world literature (in English translations) representing the more important periods and genres from antiquity to the renaissance. Note: Formerly part of C LIT 200. Only one of C LIT 201 and 202, or 301 and 302, or 201 and 302, or 202 and 301 may be taken for credit.

C LIT 202. *Introduction to World Literature II.* ☐ 3.0 (either term, 3-0-0). An analysis of a limited number of major works of world literature (in English translations) representing the more important periods and genres since the renaissance. Note: Formerly part of C LIT 200. Only one of C LIT 201 and 202, or 301 and 302, or 201 and 302, or 202 and 301 may be taken for credit. (★3.)

ECONOMICS

ECON 304. *Principles of Economics.* ☐ 3.0 (either term, 3-0-0). An introduction to economic principles as applied to business organization and finance; price determination; enterprise costs and output optimization; commercial and central banking; national income analysis. Note: Not acceptable for credit for students who have taken Economics 201 and Economics 202, or equivalent. (★3.)

ECON 312. *Western European Economic Development.* ☐ 3.0 (either term, 3-0-0). A survey of economic changes in Western Europe from the Industrial Revolution to the present. Note: Not to be taken by students with credit in HIST 357. (★3.)

ECON 313. *Economics of Developing Countries I.* ☐ 3.0 (First Term, 3-0-0). A survey of problems and conditions generally characteristic of the low-income countries; an introduction to theories and models of economic growth and development; a discussion of applied strategies of development with specific policy applications bearing on fiscal and monetary management, the process of capital formation and industrialization, employment and technological change. Prerequisites: ECON 201/202 or 306/307, or consent of the Department. (★3.)

ECON 314. *Economics of Developing Countries II.* ☐ 3.0 (Second Term, 3-0-0). The theoretical and policy aspects of specific economic development problems: population, agriculture, natural resources, education and manpower training, international trade, foreign aid, and technical assistance. Prerequisites: ECON 201/202 or 306/307, or consent of the Department. (★3.)

ECON 316. *The Canadian Economy, Part I.* ☐ 3.0 (either term, 3-0-0). A survey of Canadian economic development with emphasis on the function of staple exports, capital formation, government policies, and regional differentials which characterized the Nineteenth Century in Canada. (★3.)

ECON 317. *The Canadian Economy, Part II.* ☐ 3.0 (either term, 3-0-0). A survey of the economic development of Canada in the Twentieth Century. This survey includes study of immigration, foreign investment, economic effects of two world wars, natural resource exploitation and the emergence of distinct economic regions in Canada. Prerequisite: ECON 316 or consent of the Department. (★3.)

ECON 355. *Economic Analysis in the Evaluation of Large-Scale Projects.* ☐ 3.0 (either term, 3-0-0). An examination of the use of cost-benefit analysis, location theory and input-output an-

alysis in assessing the economic merits of various large-scale investment projects. Examples of current interest will be used, e.g., river basin, electrical generation and oil and gas projects. Prerequisites: ECON 201/202 or 304 or consent of the Department. (★3.)

ECON 365. *Resource Economics.* ☐ 3.0 (either term, 3-0-0). Problems of allocation and development of natural resources, including contemporary Canadian resource policy issues; nature and types of resources; the economics of conservation and resource scarcity; and the role of resources in growth. Prerequisite: ECON 201/202 or 304 or 306/307. (★3.)

ECON 392. *Comparative Economics.* ☐ 3.0 (either term, 3-0-0). A comparative study of the institutions and theories of important contemporary systems of economics organization, with emphasis on the "mixed" capitalist economy, "market socialism" and centrally planned economies. A survey of socialist economic thought, in particular Marxian economics. Prerequisites: ECON 201/202 or consent of the Department. (★3.)

ECON 393. *The Soviet Economy.* ☐ 3.0 (either term, 3-0-0). The development and institutional arrangements of the Soviet economy. Soviet experience with central planning. Economic performance and its evaluation. Soviet economic reforms. Prerequisites: ECON 201/202 or consent of the Department. (★3.)

ENGLISH

ENGL 210. *English Literary Forms.* ☐ 6.0 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction. (★6.)

ENGL 215. *Introduction to the Study of Literature.* ☐ 3.0 (either term, 3-0-0). A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265. (★3.)

ENGL 270. *Readings in Poetry.* ☐ 3.0 (either term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry. Prerequisite: ENGL 215. (★3.)

ENGL 275. *Readings in Prose.* ☐ 3.0 (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically. Prerequisite: ENGL 215. (★3.)

ENGL 284. *Canadian Literature in Process.* ☐ 3.0 (either term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English. Prerequisite: ENGL 215. (★3.)

HISTORY

HIST 200. *European History.* ☐ 7.0 (3-1s-0). The evolution of European society from the decline of the Roman Empire in the West to the present. (★6.)

HIST 201. *European History since the Renaissance.* ☐ 6.0 (3-0-0). (★6.)

HIST 202. *Introduction to Medieval Europe.* ☐ 6.0 (3-0-0). Europe from the fall of Rome to the Renaissance. (★6.)

HIST 204. *Studies in the Political and Social History of Europe.* ☐ 3.0 (either term, 3-0-0). A course dealing with four or five particular historical topics, from the fall of Rome to 1914 using an integrated text and monograph studies. (★3.)

HIST 206. *Introduction to the History of Women.* ☐ 3.0 (either term, 3-0-0). This course is an introduction to the study of woman's history. It will examine the position of women in western societies from the Middle Ages to the Twentieth Century. (★3.)

HIST 278. *An Introduction to the Study of Canadian History 1500-1867.* ☐ 3.0 (First Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian history. (★3.)

HIST 279. *An Introduction to the Study of Canadian History 1867-1967.* ☐ 3.0 (Second Term, 3-0-0). Designed to provide a foundation for senior and advanced courses in Canadian history. (★3.)

HIST 280. *Asia to 1500.* ☐ 3.0 (either term, 3-0-0). A survey of the history of Asia to the beginning of the sixteenth century. (★3.)

HIST 281. *Asia From 1500.* ☐ 3.0 (either term, 3-0-0). A survey of the history of Asia from the sixteenth century. Prerequisite: HIST 280 or consent of the department. (★3.)

PHILOSOPHY

PHIL 230. *Problems of Philosophy.* ☐ 3.0 (either term, 3-0-0). Some of the central issues of philosophy. Topics such as freedom and determinism, the concept of a person, mind and body, the existence of God, the nature of goodness, justice and value, the nature of knowledge, belief and truth, the problems of scepticism and knowledge in regard to ourselves, other persons and the external world. (★3.)

PHIL 239. *Philosophical Analysis of Contemporary Issues.* ☐ 3.0 (Second Term, 3-0-0). Philosophical analysis of contemporary problems of social concern. Topics such as minority and majority rights, cultural preservation, war and violence, censorship, medical ethics, abortion, sexual equality, our place in the natural environment. (★3.)

PHIL 240. *Introduction to Western Philosophy.* ☐ 6.0 (3-0-0). An introduction to the main problems and theories that have dominated philosophical thought in the Western world, through study and discussion of selected philosophical classics. Emphasis upon both a sound acquaintance with the main outlines of our philosophical tradition and the ability to handle philosophical ideas independently. (★6.)

POLITICAL SCIENCE

POL S 201. *Introduction to Government.* ☐ 3.0 (either term, 3-0-0). An introduction to the institutions of Canadian and other democratic governments, considering constitutions, legislatures, executives, the public service, courts, federal and other divisions of government authority and other selected topics. (★3.)

POL S 202. *Introduction to Politics.* ☐ 3.0 (either term, 3-0-0). An introduction to the process of democratic politics considering power, or influence, democracy, civil liberties and rights, political ideology, public opinion, elections, political parties, interest groups and other selected topics. (★3.)

POL S 322. *Local Government and Administration.* ☐ 3.0 (either term, 3-0-0). The structure and functions of local government in Canada with primary emphasis on the Province of Alberta. Note: Designed primarily for students who want one senior course in Political Science. Not open to students who are taking or have taken POL S 323. (★3.)

SOCIOLOGY

SOC 202. *Introductory Sociology.* ☐ 6.0 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. (★6.)

84.9.2 BUSINESS ADMINISTRATION AND COMMERCE

ACCOUNTING

ACCTG 202. *Introductory Accounting.* ☐ 3.8 (either term, 3-1.5s-0). Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors and other external decision-makers. Prerequisites: ECON 201/202. (★3.)

ACCTG 204. *Managerial Information and Control Systems.* ☐ 4.0 (either term, 3-0-2). Corporate goals, planning and control concepts, cost accumulation for pricing purposes, and product costing. Prerequisite: ACCTG 202. (★3.)

FINANCE

FIN 304. *Business Finance.* ☐ 3.0 (either term, 3-0-0). Introduction to financial decision-making. Prerequisites: ACCTG 204, MANEC 323, MGTSC 307 and 357. (★3.)

INDUSTRIAL RELATIONS

IND R 304. *Industrial Relations in Canada.* ☐ 3.0 (either term, 3-0-0). Union, management and government participation in the Canadian industrial relations system. It examines the nature, causes and possible methods of settling labor disputes and processing grievances. It gives the student a chance to participate in simulated negotiations of collective agreements. (★3.)

LEGAL RELATIONS

LEG R 310. *Commercial Law.* ☐ 3.0 (either term, 3-0-0). An introduction to the Canadian legal system with emphasis on legal problems in commercial law. (★3.)

MANAGEMENT SCIENCE

MGTSC 356. *Introduction to Management Science (Operations Research).* ☐ 3.0 (either term, 3-0-0). A problem-solving course designed to introduce the student to management science. The following topics are usually covered: history and overview of management sciences; linear programming including formulation of linear problems, simplex programming solution techniques, and sensitivity analysis; transportation and other network algorithms. Prerequisites: MATH 243, MGTSC 306, and 357. (★3.)

MGTSC 410. *Advanced Topics in Management Science.* ☐ 3.0 (First Term, 3-0-0). Advanced mathematical programming including problems of suboptimization; the decomposition principle; integer programming; optimal search techniques; quadratic programming; general non-linear programming and dynamic programming. Prerequisite: MGTSC 356. (★3.)

MGTSC 411. *Operations Research in the Private and Public Sectors.* ☐ 3.0 (Second Term, 3-0-0). Management science and operations research models applied to real operating systems. This course will present case studies illustrating all aspects of the application of quantitative models to actual problems. Modelling the system and interpreting the results will be stressed as opposed to developing solutions and techniques. Areas of application may include: marketing, finance, urban problems, health care delivery, and crime prevention.

Prerequisites: MGTSC 356 and 412. (★3.)

MARKETING

MARK 304. *Fundamentals of Marketing.* ☐ 3.0 (either term, 3-0-0). The evaluation of marketing in the economy. Marketing structure, organization and behavior; marketing functions. Prerequisites: ACCTG 204, LEG R 310, MANEC 323, 333, MGTSC 307, 357, and ORG T 303, 305; or by consent of the Chairman of the Department of Marketing and Economic Analysis. (★3.)

84.9.3 SCIENCE

CHEMISTRY

CHEM 203. *Introductory University Chemistry I.* ☐ 4.3 (either term, 3-1s-3/2). Chemical energy, enthalpy, Hess' Law and applications to bond energies and stability of compounds. Ionic and covalent compounds, principles of chemical equilibrium with applications to acid-base chemistry. Chemistry of hydrogen and the oxygen group. Prerequisite: Chemistry 30 or equivalent. (★4.)

CHEM 205. *Introductory University Chemistry II.* ☐ 3.8 (Second Term, 3-0-3/2). Oxidation and reduction, electrochemical cells and the Nernst Equation, free energy and equilibrium. Chemistry of the halogens and the transition metals. Chemical kinetics. Prerequisite: CHEM 203. (★4.)

CHEM 350. *Organic Chemistry.* ☐ 9.0 (3-0-3). The study of molecular structure and reactivity of organic compounds of both biological and industrial interest. Special attention is given to the chemistry of polymers, fats, peptides and carbohydrates. Methods of structure determination are discussed. Prerequisite: CHEM 200 or 202 or 203 and 205. Note: Students who have obtained credit for CHEM 250 cannot take CHEM 350 for credit. (★6.)

CHEM 370. *Elementary Physical Chemistry.* ☐ 9.0 (3-0-3). The laws of thermodynamics; calorimetry, phase equilibrium, chemical equilibrium and solution theory, kinetic-molecular theory; chemical kinetics. Prerequisites: CHEM 200 or 202, or 203 and 205; MATH 212 and 213 or equivalent. (★6.)

CHEM 432. *Inorganic Chemistry.* ☐ 6.0 (3-0-0). Prerequisites: CHEM 203 and 205. (★6.)

CHEM 434. *Inorganic Chemistry.* ☐ 7.5 (3-0-3; 3-0-0). Prerequisites: CHEM 203 and 205. (★8.)

CHEM 452. *Organic Chemistry.* ☐ 6.0 (3-0-0). Mechanism and reactions of aromatic and aliphatic compounds. Prerequisite: CHEM 350. Prerequisite or corequisite: CHEM 370. (★6.)

COMPUTING SCIENCE

Note on credit for introductory Computing Science courses: Credit will be granted for only one of 214, 261, 300, 351 and 357, and for only one of 215 and 352.

CMPUT 214. *Introduction to Computing Science.* ☐ 4.5 (First Term, 3-0-3). History and application of computers; algorithms; flow diagrams; use of a high level programming language in the solution of elementary numerical and non-numerical problems. Corequisite: MATH 207, 202 or 203 or consent of the Department. See above note on introductory Computing Science courses. (★3.)

CMPUT 215. *Elementary Data Structures.* ☐ 4.5. (Second Term, 3-0-3) Representation and manipulation of data structures by a high level language, strings, arrays, linked lists, stacks, queues, trees, applications of data structures,. Prerequisite: CMPUT 214. Corequisite: MATH 208 or 204 or consent of the Department. See above note on introductory Computing Science courses. (★3.)

CMPUT 300. *Problem Solving and Programming.* ☐ 3.0 (either term, 2-0-2). An introduction to problem solving by computer: analyzing problems; formulating algorithms; programming in FORTRAN IV and APL; and the use of MTS terminals. FORTRAN IV and the numerical solution of engineering and scientific problems will be emphasized. Credit will be granted for only one of CMPUT 214, 261, 300, 351 and 357. (★2.)

CMPUT 314. *Foundations of Computing Science.* ☐ 4.5 (First Term, 3-0-3). Review of sets and relations, digraphs, applications of Boolean algebra, minimization, topological sorting, maximal flow and scheduling network algorithms, paths and cycle algorithms, finite representations of numbers and discrete structures, systematic programming, correctness of programs, algorithms, automata and formal grammars. Prerequisite: CMPUT 215 or 352. Note: Credit will be granted for only one of CMPUT 314 or 364. (★3.)

CMPUT 315. *Computer Organization and Programming.* ☐ 4.5 (Second Term, 3-0-3) Computer architecture, physical characteristics of input, output and storage devices, detailed study of an assembler language including macros, subroutines, coroutines and input-output operations, elementary operating systems concepts, programming aids, loaders, assemblers, compilers, program libraries. Prerequisite: CMPUT 215 or 352. Note: Credit will be granted for only one of CMPUT 315 or 365. (★3.).

CMPUT 322. *Applied Statistics.* ☐ 4.0 (Second Term, 3-0-2). Sampling distributions, estimation, hypothesis testing, linear regression of two or more random variables, simulation of samples, cost analyses, applications which are primarily of interest to computing scientists. Prerequisite CMPUT 321. Corequisite: MATH 303. (★3.)

CMPUT 414. *Programming Languages.* ☐ 3.5 (First Term, 3-0-1). Formal definition of programming languages; introduction to syntax analysis; properties of algorithmic languages; list processing languages; run-time representation of program and data structures. Prerequisite: CMPUT 314/315 or 364/365. (★3.)

CMPUT 416. *Systems Programming.* ☐ 4.0 (Second Term, 3-0-2) Detailed study of assembler language facilities under a large-scale operating system, data management, task management, job management, loading and subroutine linkage input-output and channel programming and hardware. Prerequisite: CMPUT 314/315 or 364/365. (★3.).

CMPUT 417. *Basic File Management.* ☐ 3.0 (either term, 3-0-0) The use of computers for file management and associated automatic information processing with concurrent study of and practice with the COBOL language. Prerequisite: CMPUT 315 or 365. (★3.).

CMPUT 458. *Numerical Analysis.* ☐ 3.0 (either term, 3-0-0). An introduction to numerical methods with engineering applications. Topics include solution of nonlinear equations, interpolation, integration, matrix methods, and ordinary differential equations. Prerequisites: CMPUT 300 or equivalent, MATH 312 and 313. (★3.)

CMPUT 462. *Switching Theory and Logical Design.* ☐ 4.5 (Second Term, 3-0-3). Codes: synthesis of gate networks, simplification of combinatorial networks; fault detection; reliability; threshold logic; synchronous and asynchronous sequential machines; minimization. Prerequisite: CMPUT 315 or 365, or equivalent. (★3.)

CMPUT 472. *Theory of Computation I.* ☐ 3.0 (First Term, 3-0-0) Effective procedures; simple programming languages; computable functions; recursive functions; Turing machine, semi-computable predicates; computing science—its definition and development. Prerequisite: CMPUT 314 or 364. (★3.

GEOLOGY

GEOL 308. *Earth's Physical Resources.* ☐ 3.0 (Second Term, 3-0-0). Resources and resource systems of planet Earth; energy resources and mineral deposits; constructional and other bulk materials; implications of earth resource systems in human affairs. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302. (★3.)

GEOL 320. *Principles of Sedimentation and Stratigraphy.* ☐ 4.5 (Second Term, 3-0-3). Sedimentary processes, environments and facies; properties and classification of sedimentary rocks; stratigraphic nomenclature and the stratigraphic column; principles of stratigraphic paleontology. Prerequisites: GEOL 202 and 203. (★3.)

GEOL 380. *Geomorphology.* ☐ 4.5 (First Term, 3-0-3). Land forms and the processes which create and modify them; study of landforms on aerial photographs and topographic maps. Prerequisite: GEOL 390 or 401. (★3.)

GEOL 390. *Engineering Earth Sciences.* ☐ 4.5 (First Term, 3-0-3). Rock-forming minerals, igneous activity and igneous rocks, metamorphic and sedimentary rocks, economic minerals; rock weathering and soil formation, mass wasting, groundwater; deformation of the earth's crust. Laboratories on identification of minerals and rocks and the interpretation of geological maps and aerial photography. Not available to students who have taken GEOL 401. (★3.)

GEOL 391. *Engineering Geology.* ☐ 4.5 (Second Term, 3-0-3). Introduction to geological topics important in engineering and regional planning; mass-wasting, hydrogeology, surficial geology, weathering processes and their effects on natural materials. Analysis of aerial photographs and maps to determine constraints on land use imposed by geology. Prerequisite: An introductory course in geology. (★3.)

GEOL 401. *Basic Geology for Senior Students.* ☐ 4.5 (First Term, 3-0-3). The structure and composition of the earth, continents and oceans. Minerals and rocks; the time-scale, historical geology and an introduction to geotectonics. Not available to students who have taken GEOL 390. Intended for graduate students or students majoring in subjects other than geology. (★3.)

GEOL 423. *Subsurface Geological Methods.* ☐ 4.5 (First Term, 3-0-3). Methods of acquiring geologic data from beneath the surface by remote means: drilling, sampling, coring, logging; significance of geophysical techniques; presentation of subsurface information. Prerequisites: GEOL 320 and 362 or consent of Department. (★3.)

GEOL 440. *Hand Specimen Petrography.* ☐ 4.5 (Second Term, 3-0-3). Study of igneous, sedimentary and metamorphic rocks in hand specimens. Not available to students with credit in GEOL 445, 446, or 447. Prerequisite: GEOL 202 or 204 or 390 or 401. (★3.)

GEOL 460. *Structural Geology I.* ☐ 4.5 (First Term, 3-0-3). Nature, orientation, measurement, representation and analysis of planar and linear structures, faults, joints and folds. Prerequisites: GEOL 362 and PHYS 240 or PHYS 205 and 207. (★3.)

GEOL 482. *Glacial and Periglacial Geology.* ☐ 4.5 (First Term, 3-0-3). Elements of glaciology; character and origin of glacial deposits and landforms; geological processes, sediments and landforms in the periglacial environment; frozen ground phenomena, including permafrost; glacio-isostatic rebound and eustatic changes in sea level; glacial history of Western Canada; field trips. Prerequisite: GEOL 380 (★3.)

GEOL 524. *Petroleum Geology I.* ☐ 4.5 (First Term, 3-0-3). Origin and accumulation of petroleum hydrocarbons; stratigraphic and geographic distribution of oil and gas deposits; petroleum exploration; case histories. Prerequisites: GEOL 362 and 420 or 421. (★3.)

GEOL 525. *Petroleum Geology II.* ☐ 3.0 (First Term, 3-0-0). Characteristics of classic oil and gas provinces and fields; geologic analysis of sedimentary basins; economics of petroleum; case histories. Prerequisite: GEOL 524. (★3.)

GEOL 563. *Structural Geology II.* ☐ 4.5 (Second Term, 3-0-3). Numerical geometric analysis; analysis of strain; structural associations. Prerequisite: GEOL 460. (★3.)

GEOL 588. *Hydrogeology.* ☐ 4.5 (First Term, 3-0-3). The occurrence, distribution, movement, and chemistry of groundwater as a function of the geological environment; groundwater as a geologic agent; methods of collection, organization, and use of hydrogeologic data; groundwater budgets, model studies, selected problems and case histories. Prerequisites: GEOL 380, MATH 204. (★3.)

GEOL 592. *Photogeology and Remote Sensing.* ☐ 3.5 (First Term, 2-0-3). The application of aerial photographs to geologic mapping and terrain analysis; interpretation of remote sensing in geology. Sensor geological structure and landforms; principles and capabilities; analysis of imagery. Prerequisite: Consent of the Department. (★3.)

MATHEMATICS

MATH 212. *Calculus I.* ☐ 4.0 (either term, 3-0-2). Coordinates, geometry of lines and planes. Functions, limits, continuity, derivatives and applications. Integration and applications. Prerequisite: Mathematics 30 (for students who have not had trigonometry, MATH 101 is a corequisite). Note: This course may not be taken for credit if credit has already been obtained in MATH 202, 203, 207 or 245. (★4.) Note: students in all sections of this course will write a common final examination.

MATH 213. *Calculus II.* ☐ 5.0 (either term, 4-0-2). Applications of integration to lengths, areas, volumes and masses. Transcendental functions. Methods of integration, polar coordinates, parametric equations. Vectors, vector functions and derivatives. Prerequisite: MATH 212 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either MATH 204 or 208. (★4.) Note: students in all sections of this course will write a common final examination.

MATH 312. *Linear Algebra and Infinite Series.* ☐ 3.0 (either term, 3-0-0). Review of elementary vector operations. Linear transformations, matrices and matrix operations. Eigenvalues and eigenvectors. Infinite Series, examples. Prerequisite: MATH 213 or equivalent. (★3.) Note: students in all sections of this course will write a common final examination.

MATH 313. *Differential Equations I.* ☐ 4.0 (Second Term, 3-0-2). First order linear and non-linear equations. Linear differential equations with constant coefficients. Laplace Transforms, applications, Picard's Method. Series solutions. Prerequisite: MATH 213 or equivalent. Prerequisite or corequisite MATH 312. Note: This course may not be taken for credit if credit has already been obtained in MATH 317. (★3.) Note: students in all sections of this course will write a common final examination.

MATH 315. *Calculus III.* ☐ 3.0 (either term, 3-0-0). Partial differentiation, derivatives of integrals. Multiple integration using rectangular, cylindrical and spherical coordinates. Vector Field Theory. Prerequisite: MATH 213 or equivalent. (★3.) Note: students in all sections of this course will write a common final examination.

MATH 317. *Differential Equations I.* ☐ 2.5 (First Term, 2-0-1). First order linear and non-linear differential equations. Integrating factors. The general linear equation, Wronskians independence. Equations with constant coefficients. Variations of parameters, undetermined coefficients. Prerequisite: MATH 213 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 313. (★2.)

MATH 318. *Differential Equations II.* ☐ 2.5 (Second Term, 2-0-1). Power series solutions. Laplace transforms, inverse transforms and applications. Prerequisite: MATH 317 or equivalent. (★2.)

MATH 401. *Advanced Calculus and Differential Equations I.* ☐ 3.0 (First Term, 3-0-0). First and second order differential equations. The Laplace transform, series solution of differential equations, method of Frobenius. Special functions, Legendre and Bessel functions. Prerequisite: MATH 303 or equivalent. Note: Credit may not be obtained for both MATH 401 and MATH 431. (★3.)

MATH 402. *Advanced Calculus and Differential Equations II.* ☐ 3.0 (Second Term, 3-0-0). Vector analysis, line and surface integrals. Theorems of Green and Stokes, applications, curvilinear coordinates, Jacobians. Boundary value problems, Fourier series. Prerequisite: MATH 401 or MATH 431 or equivalent. (★3.)

MATH 408. *Theory of Functions of a Complex Variable.* ☐ 3.0 (either term, 3-0-0). Complex numbers, complex series. Functions of a complex variable. Cauchy's theorem and contour integration, conformal mappings. Schwart-Christoffel transformation, inverse Laplace transforms. Prerequisite: MATH 315 or equivalent. (★3.)

MATH 412. *Linear Algebra.* ☐ 3.0 (either term, 3-0-0). Abstract vector spaces. Transformations of coordinates, hermitian matrices. Characteristic values, similarity, diagonalization. Orthogonalization, canonical forms of matrices. Quadratic forms, inner-products, functions of matrices with application to linear systems of differential equations. Introduction to ten-

sor analysis. Prerequisite: MATH 312 or consent of the Department. (★3.)

MATH 413. *Advanced Calculus I.* ☐ 3.0 (either term, 3-0-0). Review of ordinary differential equations. Boundary value problems, applications. Orthogonality, completeness and Fourier series. Solution of Laplace, heat and wave equations by Fourier series, transforms. Numerical methods. Prerequisites: MATH 312, 313 and 315 or equivalent. (★3.)

MATH 414. *Advanced Calculus II.* ☐ 3.0 (Second Term, 3-0-0). Series solutions of ordinary differential equations. Bessel, Legendre and Hermite equations. Vibrating membranes, heat flow in solids, gravitational potential. Transform methods. Additional topics may be added at the request of the students. Prerequisite: MATH 413 or equivalent. (★3.)

MATH 431. *Introduction to Differential Equations.* ☐ 3.0 (First Term, 3-0-0). First order equations, second order equations with constant coefficients. Series solutions, with a brief introduction to separation of variables, application to boundary value problems of mathematical physics, elementary special functions. Elementary transform techniques. Prerequisites or corequisites: MATH 222, 302 or 307 and MATH 378 or 381. (★3.)

MATH 432. *Intermediate Differential Equations.* ☐ 3.0 (Second Term, 3-0-0). Elementary existence and uniqueness theorems, stability, perturbation theory, introduction to numerical methods. Introduction to phase plain analysis. Prerequisite: MATH 431. Prerequisite or corequisite: MATH 303 or 308. (★3.)

MATH 436. *Introduction to Partial Differential Equations.* ☐ 3.0 (Second Term, 3-0-0). Introduction to partial differential equations. Cauchy-Kowalewski's theorem, classification of second order linear equations. Elliptic equations (Laplacian and Schrodinger — fundamental solutions, maximal principles, growth estimates). Hyperbolic equations (wave equation characteristics, singularities, Duhamel's principle, Riemann's method, method of descent). Parabolic equations (heat equation; maximal principles, parametrics). Concept of well-posed problem in the sense of Hadamard. Introduction to numerical methods. Von Neumann criterion. Prerequisite: MATH 431. (★3.)

MATH 437. *Boundary Value Problems.* ☐ 3.0 (Second Term, 3-0-0). Boundary value problems of classical Math Physics, orthogonal expansions, classical special functions. Advanced transform techniques. Prerequisite: MATH 431. (★3.)

MATH 452. *Analysis I.* ☐ 3.0 (First Term, 3-0-0). Construction of real numbers, Heine-Borel and related theorems, uniform continuity, series of functions, uniform convergence, Riemann integral, integration of series; metric topological, Banach and Hilbert spaces, bounded linear operators. Prerequisite: MATH 315 or MATH 303 or equivalent. (★3.)

MATH 453. *Analysis II.* ☐ 3.0 (Second Term, 3-0-0). Measurable sets, Lebesgue integrals, linear spaces, and linear operators. Prerequisite: MATH 452. (★3.)

MATH 480. *Cartesian Tensors and Applications.* ☐ 3.0 (First Term, 3-0-0). Euclidean vector spaces. Linear transformations and matrices. Algebra of cartesian tensors. Vector and tensor calculus. Determinants. Structure of second-order tensors. Isotropic tensors. Physical applications. Prerequisites: MATH 312 and 313, or equivalent. (★3.)

MATHEMATICAL PHYSICS

MA PH 443. *Classical Mechanics I.* ☐ 3.0 (First Term, 3-0-0). Review of fundamental principles; Lagrange's equations derived from Newton's Laws and D'Alembert's Principle; non-conservative and non-holonomic systems; central force problem; motion of a rigid body. Prerequisite: PHYS 343 and MATH 303 or 308. (★3.)

MA PH 551. *Mathematical Methods of Physics I.* ☐ 3.0 (First Term, 3-0-0). Application to problems in physics of: method of steepest descent; Fourier and Laplace transforms; boundary-valve problems, integral equations and Green's functions. Prerequistes:PHYS 471 and 482, or consent of both departments. (★3.)

MA PH 553. *Mathematical Methods of Physics II.* ☐ 3.0 (Second Term, 3-0-0). Application to problems in physics of: contour integral solutions of linear differential equations; Legendre, Bessel and hypergeometric functions with complex arguments; applications to the differential and integral equations of mathematical physics; perturbation theory; calculus of variations; conformal mapping; elements of group theory. Prerequiste: MA PH 551 or consent of both departments. (★3.)

PHYSICS

PHYS 231. *Mechanics.* ☐ 3.6 (either term, 3-0-3/2). Kinematics; particle dynamics; work and energy; linear momentum; gravitation; oscillations. Prerequisites: Mathematics 30, Physics 30. Corequisite: MATH 212. (★3.)

PHYS 233. *Waves, Sound and Optics.* ☐ 3.8 (either term, 3-0-3/2). Gravitation. Simple harmonic motion. Waves on a string. Compressional waves. Reflection and refraction. Lenses. Interference. Diffraction. Polarization. Prerequisite: PHYS 231. (★3.)

PHYS 235. *Electricity and Magnetism.* ☐ 4.3 (either term, 3-2s/2-3/2). Charge; electric field; Gauss's law; electric potential; capacitance; currents and resistance; EMF and DC circuits; magnetic field; Ampere's law; Faraday's law; inductance. Prerequisite: PHYS 231. (★3.)

PHYS 331. *Electricity and Magnetism.* ☐ 4.3 (Second Term, 3-2s/2-3/2). Electrostatics, electric field, potential capacitance, magnetic field, electromagnetism, induced to EMF, inductance. Prerequisites: PHYS 233 and MATH 213. (★3.)

PHYS 333. *Electricity and Magnetism.* ☐ 5.0 (First Term, 3-1s-3). An introductory course in electrostatics, currents, magnetism and electromagnetic induction. Prerequisites: PHYS 233 and MATH 213. (★3.)

PHYS 343. *Mechanics.* ☐ 3.0 (Second Term, 3-0-0). Particle dynamics; central forces; planetary motion; Rutherford scattering; potential theory; damped and forced harmonic oscillators; wave motion; vibrating strings and normal modes. Prerequisites: PHYS 233 and MATH 313 or 317. (★3.)

PHYS 351. *Relativity.* ☐ 3.0 (Second Term, 3-0-0). Postulates of Special and General relativity including acceleration, four-vectors, energy and momentum, relativistic connection between electric and magnetic fields, curved space, gravitation and black holes. Prerequisites: PHYS 233 and MATH 213. (★3.)

PHYS 371. *Introductory Atomic and Nuclear Physics.* ☐ 3.0 (Second Term, 3-0-0). Thermal radiation and the quantum theory. Planck's radiation law; photoelectric and Compton effects; Bohr atom; periodic table; X-rays. Corequisite: PHYS 331 or 333. (★3.)

PHYS 382. *Electricity and Magnetism.* ☐ 4.0 (2-0-0). A basic course in electricity and magnetism. Maxwell's equations and magnetism. Maxwell's equations in intregal form will be developed from the experimental evidence. Methods for treating DC and AC electric circuits and the properties of dielectrics will be included in the development. Prerequisite: PHYS 233. Corequisites: MATH 313/317. Credit may not be obtained for both PHYS 340 and 382. (★4.)

PHYS 390. *Physics Laboratory A.* ☐ 3.0 (0-0-4.5). Experiments in mechanics, atomic physics, electricity and magnetism. This course is intended for students in the Honors and Specialization programs. Prerequisites or corequisites: PHYS 343, and 340 or 382, or consent of the Department. (★3.)

PHYS 417. *Introduction to Wave Mechanics and Theory of Solids.* ☐ 3.0 (Second Term, 3-0-0). The Schrodinger equation, quantum statistics, binding forces, electron theory of solids, properties of metals and semi-conductors. Prerequisites: PHYS 331 or 333 and MATH 313 or 317. (★3.)

PHYS 461. *Physical Optics.* ☐ 3.0 (First Term, 3-0-0). Complex optical systems; Fresnel and Fraunhofer diffraction; polarization; interaction of light and matter; thin films; lasers and holography. Prerequisites: PHYS 331, 333, 340 or 382. (★3.)

PHYS 471. *Quantum Mechanics A.* ☐ 3.0 (Second Term, 3-0-0). Wave packets, Fourier transforms, group velocity, etc. The basic postulates of quantum mechanics. Solutions of the Schrodinger equation in three dimensions, angular momentum, square well, harmonic oscillator, hydrogen atom. Prerequisite: PHYS 382. Prerequisite or corequisite: MATH 402 or 437. (★3.)

PHYS 482. *Electromagnetic Theory.* ☐ 6.0 (3-0-0). Laplace's and Poisson's equations applied to simple cases. Maxwell equations and solutions under various boundary conditions, transmission lines, wave guides, and antennae. Theory of dielectrics and magnetic media. Introduction to plasma physics. Prerequisite: PHYS 382. Prerequisites or corequisites: MATH 401 and 402 or 431 and 437. (★6.)

PHYS 497. *Physics Laboratory.* ☐ 3.0 (Second Term, 0-0-6). A continuation of PHYS 493 with experiments in optics, electricity and magnetism. This course is intended for students in the Honors and Specialization programs. Prerequisite: PHYS 493 or 495. Corequisite: PHYS 482. (★3.)

PHYS 509. *Statistical Physics for Engineers.* ☐ 3.0 (First Term, 3-0-0). Quantum states, temperature, entropy, chemical potential, Boltzmann factor, fermions and bosons, kinetic theory of gases, Fermi-Dirac distributions and electrons in metals, Bose-Einstein distributions and photons, Debye theory of photons. Bose-Einstein condensation. Prerequisite: PHYS 331 or 333. (★3.)

PHYS 511. *Statistical Physics I.* ☐ 3.0 (First Term, 3-0-0). Kinetic theory of gases, canonical distribution and applications, grand canonical ensemble. Prerequisites: PHYS 382 and MATH 401/402, or 408. (★3.)

PHYS 513. *Statistical Physics II.* ☐ 3.0 (Second Term, 3-0-0). Quantum statistics, black body radiation, Debye theory of solids, ortho and parahydrogen, Fermi theory of B-decay. Prerequisite: PHYS 511. (★3.)

PHYS 515. *Introductory Solid State Physics.* ☐ 3.0 (First Term, 3-0-0). Crystal structure; crystal diffraction and reciprocal lattice; specific heat of a solid; Einstein and Debye models; free-electron theory of metals; band theory of solids; semi-conductors. Prerequisites: PHYS 471 or consent of the Department. (★3.)

PHYS 531. *Fundamentals of Modern Physics.* ☐ 3.0 (First Term, 3-0-0). Atomic theory of matter, wave-particle quality, quantum theory and wave mechanics, nuclear structure, applications of nuclear physics. Prerequisite: PHYS 331 or 333. (★3.)

PHYS 571. *Quantum Mechanics B.* ☐ 3.0 (First Term, 3-0-0). Review of the physical basis of quantum mechanics; matrix formulation; angular momentum; perturbation theory; collision theory; the many-particle Schrodinger equation; identical particles; spin and statistics; atomic and molecular systems. Prerequisite: PHYS 471 or consent of the Department. (★3.)

PHYS 573. *Nuclear and Particle Physics.* ☐ 3.0 (First Term, 3-0-0). Nuclear systematics; nuclear dimensions; semiempirical mass formula; electromagnetic moments; radioactive decay; nucleon-nucleon interactions; the deuteron; neutron-proton and proton-proton scattering; nuclear models; nuclear reactions; introduction to fundamental particles. Prerequisites: PHYS 471 or consent of the Department. (★3.)

STATISTICS

STAT 241. *Introduction to Statistics.* ☐ 4.0 (either term, 3-0-2). Random Variables and frequency distributions. Averages and variance. The binomial and normal distribution. Sampling distributions and elementary inference. The x^2-*test* for contingency tables. Regression and correlation. Analysis of Variance. Prerequisite: Mathematics 30 or equivalent. This course may not be taken for credit if credit has already been obtained in any of STAT 255, 335, 337, 365. (★3.)

STAT 335. *Probability, Statistics, and Programming.* ☐ 4.0 (First Term, 3-0-2). The calculus of probability. Binomial, multinomial, Poisson, and normal distributions. Estimation. Tests of hypothesis and confidence limits. Tests of control and control charts. Sampling plans and sequential sampling. Computer programming with applications to statistics. Prerequisite: A knowledge of basic programming. This course may not be taken for credit if credit has already been obtained in STAT 337 or 365. (★3.)

STAT 365. *Elements of Probability Theory.* ☐ 3.0 (First Term, 3-0-0). Finite probability spaces; random variables, random vectors and probability distributions on finite spaces; introduction to discrete and continuous random variables. Prerequisite: MATH 204 or equivalent. (★3.)

STAT 366. *Elements of Statistics.* ☐ 4.0 (Second Term, 3-0-2). Principles of statistical inference on finite sample-spaces; introduction to statistical inference on discrete and continuous space; some common statistical procedures. Prerequisite: STAT 365. (★3.)

NOTE: Descriptions of electives offered by other faculties will be found in the appropriate faculty calendars.

HOME
ECONOMICS

Faculty of Home Economics

91 INTRODUCTORY

91.1 Members of the Faculty

91.1.1 OFFICERS OF THE FACULTY

Professor and Dean
D. BADIR, M.Sc.

Associate Professor and Associate Dean
T. DENNIS, M.S.

Professor and Chairman, Foods and Nutrition
Z. HAWRYSH, Ph.D.

Associate Professor and Chairman, Clothing and Textiles
E. CROWN, Ph.D.

Professor and Chairman, Family Studies
D. KIEREN, Ph.D.

Administrative Officer
L. MASON

Administrative Assistant Admissions; Student Affairs
L. DE LEON, B.B.A.

91.1.2 ACADEMIC STAFF

Professors
W. ADAMS, Ph.D.
E. DONALD, Ph.D.
A. KERNALEGUEN, Ph.D.
M. E. STILES, Ph.D.

Associate Professors
P. BROGDON, M.S.
N. FETTERMAN, Ph.D.
M. GEE, M.Sc.
N. KERR, M.S.
A. LAMBERT, M.A.
J. MONTGOMERY, Ph.D.
A. OSTAPOVITCH, M.A.
E. RICHARDS, M.S.

Assistant Professors
G. BACHYNSKI, M.Sc.
P. FIELDHOUSE, M.Phil.
N. KEATING, Ph.D.
K. LAVERTY, M.Sc.
J. MARSHALL, M.Sc.
P. JELEN, Ph.D. (Food Science)
E. SNIDER, Ph.D. (Sociology)

Asistant Professor
W. J. PAGE, Ph.D. (Microbiology)

91.1.3 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Associate Professors
W. J. HAGUE, Ph.D. (Educational Psychology)

Representatives
T. HOLT, Alberta Registered Dietitians Association
B. COUSENS, Alberta Home Economics Association

Registrar of the University

Student Representatives
J. PAWELEK (Undergraduate)
L. ROLES (Graduate Students)

91.2 General Information

Home Economics is a study of the laws, conditions, principles, and ideals concerned with people's immediate physical environment and their nature as social beings. It deals especially with the relationship between the two *for the purpose of improving the quality of people's daily lives.* Consumer orientation, family dynamics and daily home living patterns are common themes running through all programs and courses. Programs are offered at bachelor's and master's degree levels.

91.2.1 UNDERGRADUATE PROGRAMS

For convenience, the Faculty divides the total field of home economics into three main areas and offers a four year undergraduate program in each one. All programs are flexible and contain sufficient options to permit tailoring the program for personal interests and career goals.

The *Clothing and Textiles Program* covers many aspects of both clothing and textiles and also introduces the student to housing and design. The social sciences, physical sciences and humanities are applied to the study of people's most personal environment — their clothing and shelter. Through choice of suitable options, the program can be designed for a broad university education or as preparation for careers in merchandising, public relations, extension services, teaching, journalism, international development, textile testing, museum work and textile arts.

Students interested in merchandising and retailing may wish to choose their options from courses offered by the Faculty of Business Administration and Commerce. A student with a flair for design may wish to select options in fine arts and other related areas. Students interested in housing may wish options from sociology, family studies, economics, geography and other related areas. The selection of English and/or communications options should help students prepare for work as consumer consultants either as journalists or radio and T.V. personalities. A student whose main

interest is the study of textiles is advised to select courses in chemistry, biochemistry, physics and mathematics while a student who wishes to proceed to museology should consider courses in anthropology, history, fine arts and recreation administration.

Students interested in studying *all* areas of Home Economics should read the material below under the headings: *Adapting the three programs for generalized study of home economics, or for a career in teaching and/or extension.*

Students who plan to undertake postgraduate study after receiving the bachelor's degree should discuss plans with the Faculty's staff members and select options which will prepare them to enter desired postgraduate degree programs (§ 93.4).

Details of the *Clothing and Textiles* program may be found in § 93.1.1.

The *Family Studies Program* provides an interdisciplinary study of the historical, contemporary and emerging family forms through formal course work and interaction with individuals and families. Field experiences are an integral part of the program. Each student is placed in a field experience with an agency in the final year of study. Through this experience the student has an opportunity to develop skills in interacting with individuals and groups and to learn how to adapt knowledge to the needs of the community.

The increasing need for support services for individuals and families suggests a growing demand for personnel trained to deal with personal and interpersonal problems. Interdisciplinary social welfare teams, recreational agencies, financial counselling groups, senior citizen groups, and agricultural extension agencies are a few of the potential employers of graduates of this program.

Two routes of Family Studies are possible. The first is a General Home Economics Route which focuses attention on all three areas of Home Economics: Family Studies, Clothing and Textiles, and Foods and Nutrition. Chemistry 250 is a necessary prerequisite to elect this route. Students desiring careers in agricultural extension, the consumer field or teaching should plan their program on these general principles. The second is a General Family Studies Route. This route is advised for students desiring greater depth in the study of the nature of the family and/or family interaction and the application of this knowledge. Biology 298 and another half option in biology are necessary prerequisites. This route is especially relevant for students desiring careers in family related social service agencies.

Students in the Family Studies Program are advised to obtain counselling early in their program of study to plan appropriate choices of basic science courses and options.

Postgraduate study may be undertaken at this or other universities; interested students should consult the faculty's staff members and should also refer to § 93.4.

Details of the *Family Studies* program may be found in § 93.1.2.

The *Foods and Nutrition Program* includes study of: the application of scientific principles in understanding the nutritional value of foods; the utilization, functions and interrelationships of nutrients in health and disease; the chemical, physical and sensory properties of food; the safety and quality of foods and their social and psychological significance. Optional courses chosen from the arts provide a broader education, while optional courses in other areas allow the student to plan a program to meet specific interests and career goals.

The program is suitable for students planning to become dietitians, nutritionists, home economists in the food industry, home economists or foods and/or nutrition specialists in provincial departments of agriculture and in consumer work. Students interested in dietetics should refer to the section below entitled: *Adapting the foods and nutrition program for dietetics training.* Students interested in the other careers may choose a variety of courses as options; early in their programs (not later than the end of the first year) they should consult the faculty's staff members for guidance in selecting suitable options.

Students interested in broadening their study to embrace *all* areas of home economics should read the material below, under the headings: *Adapting the three programs for generalized study or for a career in teaching.*

The study of foods and nutrition may be continued at postgraduate level in this and other universities. Excellent opportunities are open to the holders of the master's or doctoral degrees. Interested students should consult the faculty's staff members for guidance in designing their undergraduate programs suitably; they should also refer to § 93.4.

Details of the *Foods and Nutrition* Program may be found in § 93.1.3.

ADAPTING THE THREE PROGRAMS FOR GENERALIZED STUDY OF HOME ECONOMICS, OR FOR A CAREER IN TEACHING

It is possible to adapt all three programs for *generalized* study of home economics. Students who do not wish to concentrate on one area exclusively, but would rather acquire a general knowledge of the entire field or prepare themselves to fill positions as home economists in the extension service of provincial departments of agriculture or utility companies, may do so by enrolling in any one of the programs and selecting some optional courses from the other two. Graduates with a generalized program of this sort can *also* prepare for a career in teaching home economics by completing the Teacher Home Economics Qualification Program which appears in § 73.8 of the Faculty of Education calendar. Students interested in generalizing their programs should seek advice as soon as possible upon enrolling in the Faculty of Home Economics since careful selection of options should commence very early.

(For a description of Bachelor of Education degree program with specialization in Home Economics, see § 73.3.3 of the Faculty of Education calendar.)

ADAPTING THE FOODS AND NUTRITION PROGRAM FOR DIETETICS TRAINING

The *Foods and Nutrition* program provides an opportunity to prepare for a professional career in *Dietetics*; the interested student will find guidance in § 93.1.3 – Note C.

To qualify as a *professional dietitian* a graduate must spend twelve months in an internship approved by the Canadian Dietetic Association. The Canadian Dietetic Association recognizes that there are three kinds of dietitians: the Therapeutic Dietitian, the Food Service Administrator, and the Generalist (who has duties related to both Therapeutics and Food Service Administration). Internships to meet the needs of these three kinds of dietitians are now being offered in Canada; however, the number of specialized internships in Therapeutics and Food Service Administration are still limited. Further information about internships can be obtained by inquiring at the general office of the Fa

ulty of Home Economics. Interested students should make inquiries early in their careers.

The *Foods and Nutrition* program offered by the Faculty of Home Economics emphasizes Therapeutic dietetics and General dietetics. Until more Therapeutic internships are started, graduates may qualify by completing the Generalist internship for which they can prepare by appropriate selection of options (see § 93.1.3 — Note C).

An alternative route for those students interested in pursuing a career in Food Service Administration is a program being offered jointly by the Faculty of Home Economics and the Faculty of Business Administration and Commerce (see § 93.3 and 53.1.4). A limited number of specialized internships are available for graduates of this program who wish to qualify for membership in the Canadian Dietetic Association. Further information can be obtained in the general office of the Faculty of Home Economics.

Early in the program, students interested in *dietetics* should refer to the document entitled "Academic Requirements for Membership in the Canadian Dietetic Association — June 1972". Copies are available in the general office of the Faculty.

91.2.2 POSSIBILITIES FOR TRANSFER FROM OTHER POST-SECONDARY INSTITUTIONS

The first year of the Faculty's programs may be taken at the University of Calgary, the University of Lethbridge or one of the following Junior Colleges: Red Deer Regional, Grande Prairie Regional, Medicine Hat, Camrose Lutheran, Concordia Lutheran and Canadian Union College (see the appropriate University or College calendar).

Applications for transfer from other post secondary institutions will be evaluated individually.

91.2.3 BRIEF HISTORY OF THE FACULTY

Degree programs have been offered at the University of Alberta since 1918 when a Department of Household Economics was established. In 1928, the School of Household Economics was organized under the Faculty of Arts and Science. In 1963, it became part of the newly organized Faculty of Science and three years later it became an autonomous school. In 1976 the status and name were changed to the present designation, Faculty of Home Economics. The Faculty is not departmentalized but is organized somewhat less formally into three divisions: Clothing and Textiles; Family Studies; and Foods and Nutrition.

91.3 Course Numbering System

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 are normally restricted to senior and graduate students, 600 to graduate students only.

92 FACULTY REGULATIONS

92.1 Admission

(1) The admission requirements of the Faculty are set out in § § 13.1 and 13.10 of the University Regulations and Information for Students Calendar.

(2) *Admission With Advanced Standing*

(i) Students transferring into any B.Sc. (H.Ec.) degree program must meet all curriculum requirements of the program of their choice.

(ii) Normally, a maximum of 10 full-session courses or equivalents may be granted for work completed at other institutions.

(iii) Students who have completed more than two years of a home economics bachelor's degree program at another university are advised to seek permission from their university to attend The University of Alberta as a Visiting Student (refer to § 12.2.3 Item 3 of the University Regulations and Information for Students Calendar) rather than apply for admission into one of the programs offered by the Faculty of Home Economics.

(3) *Admission Policy for Non-Matriculated Mature Students*

Requirements: 1. Minimum age — 21 years. 2. Credit in the following two senior matriculation courses: English 30 and Chemistry 30. An average of 60% in the two courses. 3. Personal interview with the Administrative Assistant. 4. Positive recommendation from Student Counselling Services, following interview and appropriate tests*. 5. Deadline for application is June 1st.

*These should include tests of vocational interest, personality inventory and academic aptitude.

(4) *English Language Proficiency:* English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms: 1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada; 2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta; 3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta; 4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major lan-

guage of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or 5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

(a) Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

(b) Applicants presenting a TOEFL score of less than 600 but 550 or greater will usually be considered as having a minor deficiency. Subject to the requirements of the particular Faculties, such an applicant may be granted provisional admission into the University but will be required to successfully complete one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in his or her regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated (as in (a) above). (c)
An applicant presenting a TOEFL score of less than 550 will be considered as having a major deficiency in the language of instruction and will not be admitted into The University of Alberta until proficiency can be demonstrated.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

The Faculty of Home Economics Requirements. Applicants presenting a TOEFL score of less than 600 but 550 or greater will not be permitted to register in more than 4 full courses. They will be required to achieve a passing G.P.A. in these courses, and the equivalent of 600 on the TOEFL after taking the non-credit Language courses in written and conversational English offered by the Faculty of Extension.

92.2 Residence Requirements

(1) A student proceeding towards a first degree must attend at least one academic year and complete a full year's program.

(2) The final year of a degree program must normally be taken in attendance at The University of Alberta.

(3) Any student who has fulfilled the first requirement before beginning the final year of the program may apply to the Dean of the Faculty for permission to fulfill the second requirement by attendance at the Special Session of this university or at another university.

92.3 Academic Standings and Graduation

(1) To be granted a B.Sc. in Home Economics, a student must complete 20 full-session courses presenting passing grades (4 or better) in a minimum of nineteen full-session courses or equivalent, not less than a grade of 3 in the remaining full-session course or equivalent, and a grade-point average (GPA) of at least 5.0 in all courses credited toward the degree after the first year.

(2) A student transferring to the University with advanced standing will normally be required to complete at least ten full-session courses or equivalent and fulfill the residency requirement at The University of Alberta. Following enrollment at the University, a transfer student requires a GPA of at least 5.0 in those courses credited toward the degree.

(3) The Dean may, in exceptional circumstances, permit a student to accelerate or decelerate. Five full courses or the equivalent per year constitute a full course load. Normally, in order to carry more than a full course load, a student must have achieved a GPA of 6.5 based on a full course load taken in the previous year.

(4) For the purpose of obtaining passing marks or raising the GPA to the required 5.0, a student may write supplemental examinations, provided they are offered in the appropriate courses. The number of full courses or the equivalent in which supplemental examinations may be written must not exceed two per year or a total of five per degree program. For the purpose of calculating the promotion average, *the student will retain the grade of the final examination if the supplemental grade is lower.*

(5) A student who is repeating a year must pass all courses with a grade of 4 or better and obtain a GPA of 5.0. No supplemental privileges will be granted.

(6) A student will not be granted the privilege of repeating a failed course more than once during the degree program, except for reasons deemed sufficient by the Faculty's Council.

(7) A. *Degree with Distinction:* The notation "with distinction" is awarded to a graduating candidate who has obtained a GPA of 7.5 or higher *over the last two years of the program. A student who has taken part of the work at another university may be granted a degree "with distinction" at the discretion of the Faculty Council.*

B. *First Class Standing:* First Class Standing is awarded to any student, carrying a full course load, who secures a grade point average of not less than 7.5 in the work of that year.

C. *Promotion:* A student who is not in the graduating year is promotable if all courses are passed. If a student has failed one or more courses, both the GPA and the number of courses passed will be considered by the Student Promotions Committee. In some cases, a student may be required to write a supplemental examination or may be denied credit in one course because of a poor grade.

(8) A student who interrupts a degree program is warned that after an absence of two calendar years from academic study at university level it may be necessary to comply with any new regulations which have come into effect regarding program and requirements. If the absence has been of more than five year's duration, the student may be required to take placement tests.

(9) A grade of 4 in a prerequisite course represents the minimum requirement for admission to a course with a prerequisite requirement.

(10) It is the student's responsibility to be acquainted with all rules and regulations and to meet the requirements of his/her degree as outlined. The student should familiarize himself/herself with regulations described in the *Faculty of Home Economics cal-*

endar and also the *University Regualtions and Information for Students calendar.*

92.4 *Change of Registration*

The deadline for changes in registration are:
First-term and full courses: September 17.
Second Term Courses: January 12.

92.5 *Withdrawal from Courses*

Deadlines for withdrawal from courses are:
From a half course offered in the First Term, November 12.
From a full course, February 12.
From a half course offered in the Second Term, March 1.

92.6 *Student Academic Appeals Committee*

The Faculty of Home Economics Student Academic Appeals Committee hears appeals from students against any ruling on the following matters:

(a) Transfer from one program or faculty to another
(b) Continuation in a program
(c) Graduation

Students who wish to appeal a ruling affecting their academic standing, other than grades in individual courses, should direct their appeal to the Dean within 60 days following notification by the Faculty of the ruling. The Student Academic Appeals Committee will then consider the appeal. If a student wishes to carry the appeal further, the appeal may be directed to the General Faculties Council Academic Appeals Committee (§ 16.7 of the University Regulations and Information for Students calendar).

Appeals regarding the student's standing in a particular course should be directed to the instructor concerned. For reappraisal deadlines refer to § 16.3.3(2) of the University Regulations and Information for Students calendar.

92.7 *Student Advisory Service*

Advice to undergraduate students regarding academic matters is provided by two groups:

The Administrative Assistant in the General Office of the Home Economics Building handles questions concerning admission, re-enrolment, transfer, withdrawal, registration, course changes, degree requirements, after-degree programs, advanced credit, etc., and maintains records of course registration and final grades.

Members of the Faculty, the Associate Dean, and the Dean offer advice regarding broader and more general career questions, optional courses available in different areas of home economics and other fields of the University, preparation for particular careers and/or graduate programs, etc. Students are encouraged to seek consultation on these matters.

92.8 *Examinations*

1. *Unexcused Absence from Final Examinations.* A student with an unexcused absence from a final examination will be given no grade for that examination. The final grade for the course will be calculated by using zero as the raw score for the final examination.

2. *Excused Absence from Final Examinations.* Refer to § 16.3.5 of the University Regulations and Information for Students calendar.

3. *Code of Student Behavior.* Refer to § 19.2 of the University Regulations and Information for Students calendar.

93 PROGRAMS OF STUDY

93.1 *The Degree of B.Sc. in Home Economics*

93.1.1 CLOTHING AND TEXTILES PROGRAM

First Year

CL TX 200 (Design in Everyday Living) (half course)
CL TX 203 (Clothing Construction and Flat Pattern Design) (half course) (see Note A)
ART H 250 and 251
CHEM 250
ENGL 210
One full course from Group I

NOTE A: For students with experience in clothing construction and pattern making, a placement test may be written to assess level of competence. If students have adequate competency, they may substitute one half course for CL TX 203. This test may be written prior to or during in-person registration.

Second Year

CL TX 307 (Experimental Techniques in Clothing Construction) (half course)
CL TX 309 (Textile Science I) (half course)
CL TX 310 (Textile Science II) (half course)
One half course from Group II
Two full courses from Group I
Arts or Science Option

Third Year

FAM 359 (Presentation and Communications) (half course)
Three half courses from Group II
Senior Option
Option
Senior Arts or Science Option or Senior Business Administration and Commerce Option

Fourth Year

Two Senior Options
Four half courses from Groups II and III
Option

Group I includes the following courses:
SOC 202

PSYCO 260 and 261
CHEM 200
Junior Physics and/or Junior Mathematics (including Statistics)
ECON 201/202 or 306/307
HIST 200 or 201
ART 231

Group II includes the following courses:
CL TX 300 (Clothing and the Consumer)
CL TX 302 (Home Design)
CL TX 304 (History of Interior Design and Furniture)
CL TX 305 (Textile Design)
CL TX 306 (Housing)
CL TX 401 (Advanced Flat Pattern Design)
CL TX 403 (Historic Costume)
CL TX 404 (Historic Textiles)
CL TX 405 (Advanced Textile Design)
CL TX 407 (Tailoring)
CL TX 410 (Consumer Textiles)
CL TX 411 (Advanced Textiles)
CL TX 412 (Socio-cultural Aspects of Clothing)
CL TX 416 (Economics of Clothing and Textiles)
CL TX 417 (Selected Topics)
CL TX 419 (Preventive Textile Conservation)
CL TX 420 (The Fashion Industry)

Group III includes the following courses:
CL TX 502 (Independent Study I)
CL TX 503 (Independent Study II)
CL TX 506 (Practicum in Selected Areas)
CL TX 507 (Historic Resources Internship)
CL TX 510 (Current Issues in Clothing and Textiles I)
CL TX 511 (Current Issues in Clothing and Textiles II)
CL TX 512 (Current Issues in Clothing and Textiles III)
CL TX 514 (Personality and Clothing)
CL TX 517 (Selected Topics)
CL TX 518 (Textiles Seminar)
CL TX 519 (Textile Conservation Theory and Practice)

93.1.2 FAMILY STUDIES PROGRAM

First Year

FAM 241 (Family Development) (half course)
FAM 340 (Management of Family Resources) (half course)
BIOL 298 and 1/2 Jr BIOL Option or CHEM 250
PSYCO 260, PSYCO 261
SOC 202
2 half-course Open Options

Second Year

FAM 343 (Child Development) (half course)
FAM 359 (Presentation and Communication) (half course)
2 half course FD NU Options
2 half course CL TX Options
2 half course Open Options
ECON 201/202 or 306/307

Third Year

FAM 440 (Consumer Problems) (half course)
FAM 443 (Issues in Family Life Education) (half course)
FAM 448 (Family Communication) (half course)
STAT 241 or PSYCO 309 or SOC 313
5 half course Open Options
1 half course Option from Group I

Fourth Year

FAM 444 (Methods in Family Services) (half course)
FAM 445 (Practicum in Family Services)
2 half course Options from Group II
SOC 477, SOC 478
3 half course Open Options

Group I includes the following courses:
FAM 346, 347, 350, 447

Group II includes the following courses:
FAM 442, 449, 450, 460, *540, *541, *543, *551, *553, *559
* with permission

NOTE: Students registered in Family Studies prior to September, 1979 take the following program in the 4th year unless special arrangements have been made with the Division.

Fourth Year

FAM 444 (Methods in Family Services) (half course)
FAM 445 (Practicum in Family Services)
FAM 551 (Family in Crisis) (half course)
FAM 553 (Theory and Research in Marriage and the Family) (half course)
Three half courses in Arts or Science Options
Option

93.1.3 FOODS AND NUTRITION PROGRAM

First Year

BIOL 130 or two of BIOL 296, 297, 298, 299
CHEM 200
CHEM 250
Arts Option
Option (see NOTES A, B, and C)

Second Year

FD NU 320 (Basic Foods I) (half course)
FD NU 321 (Basic Foods II) (half course)
FD NU 323 (Socio-cultural Aspects of Food) (half course)
BIOCH 300
MICRB 315 and 365
Three half course options (See NOTES A, B, and C)

Third Year

FD NU 464 (Nutrition) (half course)
FD NU 465 (Nutrition) (half course)
Two senior half courses in Foods and Nutrition (See NOTE C)
CHEM 312 or Option (see NOTE C)
PHYSL 410
FAM 359 (Presentation and Communication) (half course)
Half course Option (See NOTE C)

Fourth Year

Four senior half courses in Foods and Nutrition (see NOTE D)
Two half courses or equivalent in Computing Science and/or Statistics
Option (See NOTE C)
Senior Arts Option

NOTE A: Students who have not completed Mathematics 30 must substitute Mathematics 100 for the Option.

NOTE B: Students should note that the prerequisites for FAM 359 are FAM 350 or a half course in sociology or psychology and at least two half courses in the student's major. Students proceeding to a dietetic internship are advised to take FD NU 429.

NOTE C: To qualify for entry into an approved Generalist dietetic internship, the following courses must be taken: at least one half course in the humanities (e.g., Languages, History, Philosophy); at least one half course in the social sciences (e.g., Sociology, Psychology, Economics, Anthropology); at least three half courses in administration (e.g., Organization Theory, Industrial Relations and Accounting); Food and Nutrition 406 and Foods and Nutrition 461.

NOTE D: Includes 400- and 500-level Foods and Nutrition courses or Food Science courses.

93.2 Interdisciplinary B.Sc. Program in Food Science

A four-year interdisciplinary program in Food Science is offered co-operatively by the Faculty of Agriculture and Forestry, the Faculty of Home Economics, and the Faculty of Science. It allows

students to specialize in this expanding field more than is possible in the third and fourth-year specialized program in Food Science offered by the Faculty of Agriculture and Forestry. For details of the program see § 33.2 in the Faculty of Agriculture and Forestry calendar.

The program is designed so that students may register in it immediately on entering University or may transfer from the Faculty of Agriculture and Forestry, the Faculty of Science or the Faculty of Home Economics after their first or possibly their second year. It is designed to give students a sound background in the basic sciences of chemistry, microbiology and engineering, together with the applied subject areas of food microbiology, food chemistry, food engineering and food processing. The program is intended primarily for students who wish to pursue a career in the food processing industry or related government services (e.g., Agriculture Canada, Health and Welfare Canada).

93.3 B.Com. Program with Specialization in Food Service Administration

A four-year program is offered jointly by the *Faculty of Home Economics* and the *Faculty of Business Administration and Commerce.* Students in this program can specialize more in the study of the organization, management and service aspects of quantity food production of high sensory and nutritional quality than is possible in the foods and nutrition program. For details consult the Faculty of Business Administration and Commerce calendar § 53.1.

93.4 The B.Sc. in Home Economics after Approved Degrees

1. Holders of an approved degree may qualify for the B.Sc. (H.Ec.) degree upon completion of a minimum of ten full (or equivalent) prescribed courses. All curriculum requirements in the home economics program of their choice must be met. In addition, students must pass all courses with a grade of at least 4, and must obtain a GPA of 5.0 or better in all courses credited towards the B.Sc. (H.Ec.) after an approved degree. Normally, the residence requirements must be met.

2. Holders of two or more approved bachelor's degrees may qualify for the B.Sc. (H.Ec.) degree upon completion of a minimum of 15 full (or equivalent) prescribed courses. The residence requirements must be met.

93.5 Graduate Study

Graduate study leading to the degree of Master of Science may be undertaken in the Faculty of Home Economics. The major work may be undertaken in (1) Clothing and Textiles, (2) Family Life Education, (3) Family Studies, (4) Foods, (5) Nutrition, and (6) Consumer Studies. Students wishing to pursue graduate study should consult the Dean of the Faculty of Home Economics and familiarize themselves with procedures and regulations laid down by the Faculty of Graduate Studies and Research; this information may be found in the calendar of the Faculty of Graduate Studies and Research.

93.6 Family Studies

For students wishing to develop a strong Family Studies component this can be done by adding to the courses offered in the Family Studies Division those related to family in sociology. Some of those courses are: SOC 301, 323, 341, 342, 375, 451, 456, 471, 475, 477, 478.

94 DETAILS OF COURSES

94.1 General Information

Courses open to students in the Faculty of Home Economics are listed below in alphabetical order, whether they are offered by the Faculty of Home Economics or by another faculty.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full course is weighted 6. A half course is normally weighted 3. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the research project. Some courses are offered for credit only and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full course are the same in both terms unless otherwise indicated. If the course is a half course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

94.2 Agricultural Economics

Department of Rural Economy

AG EC 381. *Retail Marketing of Agricultural Products.* ★3 (Second Term, 3-0-0). Wholesale and retail food market structures and conduct, with emphasis on consumer motivation, retail pricing strategies, and operational techniques and problems. Note: Not recommended for those specializing in agricultural economics. Prerequisites: AG EC 203 or ECON 201/202 or equivalent. [Rural Economy]

94.3 Anthropology

ANTHR 307. *Introduction to Social and Cultural Anthropology.* ★3 (either term, 3-0-0). The comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics and political institutions and religions; processes of change. Note: Not open to students who have taken ANTHR 202.

94.4 Art and Design

ART H 250. *Survey of Western Art I.* ★3 (either term, 3-0-0). A survey of Western Art to the end of the Middle Ages. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 201.

ART H 251. *Survey of Western Art II.* ★3 (either term, 3-0-0). A survey of Western Art from the beginning of the Renaissance to the present day. Note: Formerly part of ART 200; not to be taken by students with credit in that course or ART H 202.

ART 231. *Visual Fundamentals.* ★6 (2-0-4). A studio based introduction to the exploration and production, in two and three dimensions, of visually expressed information. Note: Not open to students with credit in ART 232.

94.5 Biochemistry

BIOCH 300. *General Biochemistry.* ★6 (3-0-3). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and 250 or 350.

94.6 Biology

BIOL 130. *Introductory Biology.* ★6 (3-0-3). A basic biology course emphasizing the diversity and interrelations of organisms, the relationships between form and function, heredity, cellular structure, and ecological principles. Note: Not open to students with credit in Biology 30.

BIOL 296. *Evolutionary Biology.* ★3 (either term, 3-0-3). The numbers and kinds of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: Biology 30.

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30.

BIOL 298. *Environmental Biology.* ★3 (either term, 3-0-3). The basic principles and concepts of ecology. Emphasis on structure and function of populations, communities, and ecosystems. Laboratory to include ecological experiments, demonstrations, and discussions. Prerequisite: Biology 30.

BIOL 299. *Biological Function.* ★3 (either term, 3-0-3). Comparative physiology of higher plants and animals from the standpoint of nutrition, energetics, gas exchange, circulation, ionic and osmotic relations and control systems. Prerequisite: Biology 30.

BIOL 301. *Cellular Biology.* ★3 (First Term, 3-0-3). The ultrastructure and metabolism of cells. Energy in biological systems; photosynthesis; cellular respiration; contractility; cell growth and replication. Prerequisite: BIOL 297. Prerequisite or corequisite: CHEM 250 or 350. It is recommended that BIOL 299 also precede BIOL 301.

BIOL 302. *Developmental Biology.* ★3 (Second Term, 3-0-3). Development of complex organisms. The purpose is to identify some developmental processes common to plants and animals. Emphasis is on cellular interactions which determine cell survival, gene activation and deactivation, and how cell functions and structures are selected. The course concludes with consideration of how these processes relate to aging and cancer. BIOL 301 is strongly recommended to precede BIOL 302.

94.7 Chemistry

CHEM 100. *Introductory General Chemistry.* ★6 (3-0-3). A beginning course in Chemistry covering the topics of high school chemistry from a more advanced point of view. Note: May not be taken for credit by students who have credit in Grade XII Chemistry 30.

CHEM 200. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry, thermochemistry, electro-chemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: Chemistry 30, CHEM 100, or equivalent.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (e.g., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: Chemistry 30, or CHEM 100 or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Exceptions to this may be made only if written consent of the Department is obtained.

CHEM 312. *Quantitative Analysis.* ★6 (3-0-6). Principles, methods, and experimental applications emphasizing titrimetry, separations, spectrophotometry and evaluation of experimental data. Includes examples of organic analysis, radiochemistry, atomic absorption spectroscopy, gas chromatography, and use of analytical literature. Prerequisite: CHEM 200 or 202.

94.8 Economics

ECON 201. *Introduction to Micro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy: the distribution of income, inequality and poverty; the use of the environment; government economic policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 (either term, 3-0-0). Economic analysis, problems and policies with emphasis on the Canadian economy; national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies; international trade theory, problems and government policies. Prerequisite: Mathematics 20 or Mathematics 33 or consent of the Department.

ECON 306. *General Macro-Economics.* ★3 (either term, 3-0-0). Introductory survey of macro-economic principles with an emphasis on Canadian economic issues. Note: Designed for second and third year students who do not hold credit in ECON 202 or 304. ECON 306 plus 307 are acceptable in place of ECON 201/202 as prerequisites for senior courses with the consent of the Department.

ECON 307. *General Micro-Economics.* ★3 (either term, 3-0-0). Introductory survey of micro-economic principles with an emphasis on Canadian economic issues. Note: Designed for second and third year students who do not hold credit in ECON 201 or 304. ECON 306 plus 307 are acceptable in place of ECON 201/202 as prerequisites for senior courses with the consent of the Department.

94.9 Education — Adult

EDADU 484. *Community Home Economics Education.* ★3 (either term, 3-0-0).

94.10 English

ENGL 200. *A Survey of English Literature from the Middle Ages to the Twentieth Century.* ★6 (3-0-0). A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ENGL 210. *English Literary Forms.* ★6 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

ENGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0). A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English Literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284and 290 Formerly part of ENGL 260 and 265.

ENGL 270. *Readings in Poetry.* ★3 (either term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry.

ENGL 275. *Readings in Prose.* ★3 (either term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist the student in reading critically.

ENGL 284. *Canadian Literature in Process.* ★3 (either term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English.

ENGL 290. *The Craft of Writing.* ★3 (Second Term, 3-0-0). A study of techniques of expository writing, intended to increase awareness of the resources of English prose, and to provide intensive practice in using these. Prerequisites: Any single-term course in English and consent of the Department.

94.11 Food Science

FD SC 200. *Introduction to Food Science.* ★3 (either term, 3-0-0). Historical and philosophical aspects of food supplies and food processing. World food supply and utilization. Trends in the processing, preservation, handling and utilization of food. Food fads and fallacies. No prerequisite.

FD SC 351. *Industrial Food Processing.* ★3 (First Term, 3-0-3). An introduction to the processing and preservation of foods. Prerequisite: Consent of instructor.

FD SC 461. *Food Microbiology I.* ★3 (First Term, 3-0-3). The principles of food microbiology and food poisoning. Prerequisite: MICRB 315 or equivalent.

FD SC 462. *Food Microbiology II.* ★3 (Second Term, 3-0-3). The microbiology of the food, dairy and allied industries. A continuation of FD SC 461. Prerequisite: FD SC 461 or equivalent.

FD SC 471. *Food Chemistry I.* ★3 (First Term, 3-0-3). Chemistry and biochemistry of food constituents. Prerequisites: BIOCH 300, or PL SC 431 and 432.

FD SC 472. *Food Chemistry II.* ★3 (Second Term, 3-0-0). A continuation of FD SC 471, Prerequisite: FD SC 471.

94.12 History

HIST 200. *European History.* ★6 (3-1s-0). The evolution of European society from the decline of the Roman Empire in the West to the present.

HIST 201. *European History Since the Renaissance.* ★6 (3-0-0).

94.13 Home Economics

94.13.1 CLOTHING AND TEXTILES

H EC 300. *Perspectives of Home Economics.* ★3 (3-0-0). A study of the impact of individual and family problem-solving on the near environment and wider ecosystem; major issues regarding the human and material resources of future generations and the role of home economics in confronting and dealing with these major issues.

CL TX 200. *Design in Everyday Living.* ★3 (Second Term, 3-0-3). An introductory course in design to develop visual awareness. The functional components in our physical environment and their aesthetic quality are evaluated through problem solving.

CL TX 203. *Clothing Construction and Flat Pattern Design.* ★3 (either term, 2-0-4). Interrelationship of the principles of flat pattern, pattern adjustments and garment fitting. Application of construction principles to design details and fabric characteristics.

CL TX 300. *Clothing and the Consumer.* ★3 (First Term, 3-0-0). A study of clothing in relation to needs and wants of individuals and families at different stages of the life cycle. Prerequisites: SOC 202, PSYCO 260, EDPSY 269 or EDPSY 271.

CL TX 302. *Home Design.* ★3 (First Term, 3-0-3). The study and evaluation of the functions, aesthetics and economics of space, furniture and accessories in the home environment. Prerequisite: CL TX 200.

CL TX 304. *History of Interior Design and Furniture.* ★3 (Second Term, 3-0-0). A study of styles of domestic architecture, interior design and furniture down through the ages with an emphasis on the factors which contributed to the design and the relationship of these styles to present day living. Prerequisite: ART H 250 and 251.

CL TX 305. *Textile Design.* ★3 (either term, 2-0-4). Creative problems in designing fabrics. Techniques of fabric construction and applied design. Prerequisites: CL TX 200 and CL TX 309.

CL TX 306. *Housing.* ★3 (Second Term, 3-0-0). Interdisciplinary approach to housing. Prerequisite: SOC 202 or SOC 403 or consent of the instructor.

CL TX 307. *Experimental Techniques in Clothing Construction.* ★3 (Second Term, 3-0-3). Analysis and modifications of construction techniques in relation to prescribed standards. Study and experimentation in handling fabrics which require special techniques. Prerequisites: CL TX 203 or advanced placement, and CL TX 309.

CL TX 309. *Textile Science I.* ★3 (First Term, 3-0-3). An introduction to textile serviceability concepts and textile legislation; study of textile components — fibre, yarn, fabric coloration and fabric finish.

CL TX 310. *Textile Science II.* ★3 (Second Term, 3-1s-2). Introduction to polymer and fiber structure; in-depth study of fibers including production, structure, physical and chemical properties, uses and care; special finishes and their effect on fabric properties, maintenance of textile products. Prerequisites: CHEM 250 and CL TX 309.

CL TX 400. *Design in Everyday Living.* ★3 (either term, 3-0-3). Introduction to design at the senior level; development of visual awareness and aesthetic appreciation. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 200.

CL TX 401. *Advanced Flat Pattern Design.* ★3 (Second Term, 3-0-3). Prerequisites: CL TX 200 and CL TX 307.

CL TX 403. *History of Costume.* ★3 (First Term, 3-0-2). Costumes from ancient times to the present day; their relationship to the life of the times and their importance in evolution and inspiration of modern dress. Prerequisite: HIST 200 or HIST 201 or consent of the instructor.

CL TX 404. *Historic Textiles.* ★3 (Second Term, 3-0-2). Textiles from ancient times to the present — their function, aesthetic qualities and importance as a source of inspiration for modern design. Prerequisite: HIST 200 or 201 or ART H 250/251 or consent of the instructor.

CL TX 405. *Advanced Textile Design.* ★3 (First Term, 1-0-5). An advanced studio course in applied design on fabric. Course will include specialized techniques in printing and dyeing fabric, and fabric construction with a major component of independent study. Limited enrolment. Prerequisites: CL TX 305 and consent of the instructor.

CL TX 406. *Clothing Construction.* ★3 (Second Term, 3-0-3). Application of basic principles of clothing construction and fitting to garments made of fabrics requiring special techniques. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 203 and CL TX 307.

CL TX 407. *Tailoring.* ★3 (First Term, 3-0-3). Prerequisite: CL TX 307 or consent of the instructor.

CL TX 408. *Clothing and the Consumer.* ★3 (First Term, 3-0-0). Senior level application of behavioral sciences concepts to clothing. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 300.

CL TX 409. *Textile Science.* ★3 (Second Term, 3-0-3). An introduction to textile concepts and principles. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 309 or CL TX 310.

CL TX 410. *Consumer Textiles.* ★3 (First Term, 3-0-3). Basic textile information related to consumer selection, use and care of household textiles. Prerequisite: CL TX 310.

CL TX 411. *Advanced Textiles.* ★3 (First Term, 3-0-3). Introduction to yarn and fabric geometry. Advanced study of polymer formation, specialized polymers and textile finishes. Theory of color, study of major classes of dyes. Degradation of textiles. Prerequisites: CHEM 200 and CL TX 310.

CL TX 412. *Socio-cultural Bases of Clothing.* ★3 (First Term, 3-0-0). Similarities and differences in functions of clothing in various cultures. Selection of clothing as an expression of collective behavior. Prerequisites: PSYCO 260 or SOC 202; or ANTHR 202 or 307, and CL TX 300; or consent of the instructor.

CL TX 416. *Economics of Clothing and Textiles.* ★3 (First Term, 3-0-0). The structure and economic importance of the textile and apparel industries; consumption of textiles and apparel; the impact of legislation and government policy on the textile and apparel market place. Prerequisite: ECON 201/202 or ECON 306/307.

CL TX 417. *Selected Topics.* ★3 (either term, 3-0-0 or 3-0-3 or 2-0-4). Topics of current interest in clothing, textiles and design. Prerequisite: varies with specific offering.

CL TX 419. *Preventive Textile Conservation.* ★3 (First Term, 3-0-3). Theoretical and practical investigation of the preventive care of textiles and costumes in museums or related institutions. Topics include an overview of deteriorating factors, as well as procedures for handling, storage, display, and preventive treatment. Museum collections and personnel will augment university lecture, seminar, laboratory and study collection facilities. Prerequisite: CL TX 304, 309, 403 and 404 or consent of the instructor.

CL TX 420. *The Fashion Industry.* ★3 (Second Term, 3-0-0). Study of the fashion industry and principles of retailing fashion goods. Prerequisite: CL TX 416.

CL TX 502. *Independent Study I.* ★3 (either term, 0-0-6). Independent study planned by student in consultation with faculty from one of the following areas or suitable combination of areas: Textile Science; Housing; Interiors or Furniture Design; Textile or Dress Design; History of Costume, Textile or Furniture; Textile Conservation and Clothing for Special Needs. Prerequisite: Senior course(s) in respective area or consent of the instructor.

CL TX 503. *Independent Study II.* ★3 (either term, 0-0-6). Independent study planned by student in consultation with faculty from one of the following areas or suitable combination of areas: Textile Science; Housing; Interiors or Furniture Design; Textile or Dress Design; History of Costume, Textile or Furniture; Textile Conservation and Clothing for Special Needs. Prerequisite: Senior course(s) in respective area or consent of the instructor.

CL TX 506. *Practicum in Selected Areas.* ★3 (either term, 0-1s-8). Supervised field experience. Prerequisites: Senior course in respective area and consent of the instructor.

CL TX 507. *Historic Resources Internship.* ★3 or 6. Internship with an institution involved in historic resources conservation. Normally offered in Special Sessions by special arrangement. Prerequisites: CL TX 304, 403, 404, 504 and consent of the Division.

CL TX 510. *Current Issues in Clothing and Textiles I.* ★1 (either term, 0-1s-0). Prerequisites: varies with offering. Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.

CL TX 511. *Current Issues in Clothing and Textiles II.* ★1 (either term, 0-1s-0). Prerequisite: varies with offering. Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.

CL TX 512. *Current Issues in Clothing and Textiles III.* ★1 (either term, 0-1s-0). Prerequisite: varies with offering. Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.

CL TX 514. *Personality and Clothing.* ★3 (Second Term, 3-0-0). A review of literature and research dealing with psychological processes and the application of personality and motivation theories to specific behaviors related to clothing. Prerequisites: PSYCO 383; CL TX 412; or consent of the instructor.

CL TX 517. *Selected Topics.* ★3 (either term, 3-0-0 or 3-0-3 or 2-0-4). Topics of current interest in clothing, textiles, and design. Prerequisite: Senior course(s) in respective area(s).

CL TX 518. *Textile Seminar.* ★3 (Second Term, 0-3s-0). Familiarization with current literature and developments in textiles with an emphasis on consumer-oriented textiles research. Prerequisite: CL TX 410 or 411.

CL TX 519. *Textile Conservation Theory and Practice.* ★3 (Second Term, 3-0-3). Theoretical and practical investigation of the degradation and treatment of historic textiles and costumes. Lecture and laboratory experience will include an in-depth study of factors affecting the degradation of fibres, as well as methods of cleaning, bleaching and consolidation. Prerequisites: CL TX 310 and CL TX 419.

CL TX 520. *Literature Review.* ★3 (First Term, 3-0-0). A survey of the clothing and textiles research literature obtained from the application of information retrieval techniques to the numerous secondary services which cover the literature.

CL TX 600. *Clothing and Textiles Seminar.* ★3 (either term, 0-1s-0). Topic of seminar will be chosen according to interests of students and Faculty and/or timeliness of subject matter.

CL TX 620. *Research Methods in Clothing and Textiles.* ★3 (Second Term, 3-0-0). A study of various types of research in clothing and textiles and the development of a research proposal with specific attention to: objectives of study, theoretical framework, hypotheses, sampling, data collection, analyses and interpretation of findings. Prerequisite: a half course in statistics and CL TX 520 or consent of instructor.

94.13.2 FAMILY STUDIES

H EC 300. *Perspectives of Home Economics.* ★3 (3-0-0). A study of the impact of individual and family problem-solving on the near environment and wider ecosystem; major issues regarding the human and material resources of future generations and the role of home economics in confronting and dealing with these major issues.

FAM 241. *Family Development.* ★3 (First Term, 3-0-0). Introduction to the study of the family. A review of early family forms, the forces altering them, and the emergence of contemporary family life as seen over the family life cycle. Note: Open only to Home Economics students. Not open to students who have taken SOC 371.

FAM 340. *Management of Family Resources.* ★3 (Second Term, 3-0-1.5). Introduction to the principles of management as applied to the use of family resources.

FAM 343. *Child Development.* ★3 (First Term, 3-0-0). An analysis of the physical and personality development of children in the family context. Twelve to fifteen hours of observation are required.

FAM 346. *Courtship and Marriage.* ★3 (either term, 3-0-0). A consideration of the sociological, psychological and personal factors entering into the selection of a mate, the development of a relationship, and problems of marital adjustment. Lecture with emphasis on group discussion.

FAM 347. *The Adolescent, His Family, His World.* ★3 (Second Term, 3-0-0). A study of the adolescent as a family member, developmental changes during adolescence and ways of coping with resulting problems.

FAM 350. *The Family in Transition.* ★3 (First Term, 3-0-0). An introduction to the study of the family — through the issues which surround the family and marriage in contemporary society. Reference to research studies and to historical data will provide the basis of the course. FAM 350 and SOC 371 may not both be taken for credit.

FAM 359. *Presentation and Communication.* ★3 (either term 3-0-3). Introduction to the principles of communication; their application in interpersonal, group and mass audience situations relevant to home economics. Practice in verbal communication, demonstrations and display. Prerequisites: A half course in sociology, psychology or family studies (FAM 350 for non-family majors or FAM 241 for family majors) and at least two half courses in the student's major.

FAM 440. *Consumer Problems.* ★3 (First Term, 3-0-0). An analysis of problems faced by the family as consumer, within the framework of the economic, sociological, psychological and legal factors which create these problems. Sources of information and aid for the consumer. Prerequisite: ECON 201/202 or 306/307 or completion of an approved economics module available from the Division.

FAM 442. *Family and the Mentally Retarded Child.* ★3 (either term, 3-0-0). An in-depth study of the impact of mentally retarded children on their families. Adjustment of these families and other related institutions to mentally retarded children is discussed. Socio-psychological literature is reviewed to explore theoretical and practical issues involved in the interaction between the family and the mentally retarded child. Note: To be offered as staffing will allow.

FAM 443. *Issues in Family Life Education.* ★3 (First Term, 3-0-0). An introduction to family life education as an applied area of family studies. Definition, philosophy, Canadian and North American program approaches and current program issues will be discussed. Prerequisite: FAM 241, or FAM 350 or SOC 371.

FAM 444. *Methods in Family Services.* ★3 (First Term, 1.5-0-3). Review of methods involved in family life education in a community context with special emphasis on program planning and the home economist's role in the helping process. Note: Open only to senior family studies studies majors.

FAM 445. *Practicum in Family Services.* ★6 (Second Term, 0-1.5s-16). Students will be placed in one of a variety of family related agencies for two full days per week during the Second Term. In addition, attendance at one seminar per week is required. Prerequisite: FAM 444. Note: Open only to senior family studies majors. Must be taken during the same year as FAM 444.

FAM 447. *The Family in Contemporary Society.* ★3 (Second Term, 3-0-0). An interdisciplinary study of the family in modern western society. The nature of the relationship between the family system and selected systems in society will be considered. Prerequisite: FAM 241, or 350 or SOC 371 or consent of instructor.

FAM 448. *Understanding Family Communication.* ★3 (either term, 3-0-0). The synthesis of knowledge of communication with knowledge of family relationships and the application of that combination to the student's experience. Emphasis is placed on the effect of communication on individual behaviour and family patterns.

FAM 449. *Family Study: Selected Topics.* ★3 (either term, 3-0-0). Students may enroll in this course more than once provided that each time it is taken the topic is different. Note: To be offered alternate years to FAM 442.

FAM 450. *Family Finance.* ★3 (First Term, 2-1s-1.5). Principles of money management applied to family income and expenditure. Budgeting and management of savings will be important. Special emphasis will be placed on the management of credit, investment, insurance, housing. The particular needs of low income money management will be stressed. Prerequisites: FAM 340, 440 and ECON 201/202 or 306/307 or consent of the instructor. This course will not be offered each year.

FAM 460. *Family and Consumer Law.* ★3 (3-0-0). An exploration of family and consumer law from a user's perspective. (To be taught in cooperation with the Faculty of Law.) This course will be offered during Special Sessions only.

FAM 500. *Introduction to Family Studies.* ★3 (First Term, 3-0-0). A review of the basic content and philosophy of the study of the family from the particular emphasis of the Family Studies Division. Open only to family studies graduate students or students with the consent of the Division.

FAM 540. *Seminar: Consumer Studies.* ★3 (either term, 0-3s-0). Examination of the research and theory related to consumer behavior, the application of these to consumer problems and the implications for consumer education. Prerequisite: FAM 440 or consent of the instructor.

FAM 541. *Seminar: Human Sexuality and Sex Education in Family Life Education.* ★3 (either term, 0-3s-0). Emphasis on socio-psycho-cultural factors in development of human sexuality, with consideration given to research findings and their practical application, i.e., sex education. By permission of instructor only.

FAM 543. *Seminar: Family Life Education in Home, School and Community.* ★3 (either term, 0-3s-0). Examination and analysis of the basic issues facing family life education and educators in the various settings of home, school and community. By permission of instructor only.

FAM 547. *Family Intervention Program Development and Evaluation.* ★3 (either term, 0-3s-0). This course is designed for graduate students whose professional goals are in the area of family life education. It will focus on the design, implementation and evaluation of educational intervention programs such as marriage enrichment, family enrichment, parent education. Emphasis will be educational, rather than remedial. Prerequisite: FAM 543 or consent of instructor. (A practicum experience may be arranged to be taken in conjunction with this course under FAM 649). To be offered as staff permit.

FAM 551. *Seminar in Family Crisis.* ★3 (Second Term, 0-3s-0). An analysis of the processes involved in family crisis. Family disorganization, reorganization, and change associated with such crises as alcoholism, aging, birth, and death are considered. Prerequisite: FAM 241 or FAM 350 or SOC 371 or consent of the instructor.

FAM 553. *Applied Theory and Research in Marriage and Family.* ★3 (First Term, 3-0-0). The consideration of research and theory in marriage and the family as it relates to the development of family practice in family life education and other related and practical aspects of Family Studies. Prerequisite or co-requisites: STAT 241, PSYCO 309, SOC 311 or a graduate level statistics course and a minimum of three half courses in family studies selected from home economics, sociology, educational psychology, psychology or anthropolgy.

FAM 559. *Independent Study I.* ★3 (either term, 0-0-6). Independent study of topics in family studies including independent laboratory and library research. Prerequisite: Students must receive consent from instructor prior to registration.

FAM 560. *Independent Study II.* ★3 (either term, 0-0-6).

FAM 600. *Seminar: Family Studies Research.* ★3 (Second Term, 0-3s-0). Required of all Family Studies Graduate students to discuss family research methodology related to their thesis. Prerequisites: FAM 553 and a graduate level statistics course.

FAM 645. *Seminar in Applied Theory in Marriage and Family Counselling.* ★3 (either term, 0-3s-0). Certain selected theories in marriage and family counselling are examined in terms of both their underlying assumptions and their general applicability in promoting effective counselling outcomes. By permission of instructor only.

FAM 649. *Seminar in Family Study: Selected Topics.* ★3 (either term, 0-3s-0). This course will be offered as staff and time permit. By permission of instructor only.

FAM 659. *Graduate Practicum in Family Studies.* ★3 (either term, 0-0-6). Selected practicum placements to integrate theory and practice in a variety of family agencies. Prerequisite: Consent of supervisor and division.

FAM 660. *Independent Study IV.* ★3 (either term, 0-0-6).

94.13.3 FOODS AND NUTRITION

H EC 300. *Perspectives of Home Economics.* ★3 (3-0-0). A study of the impact of individual and family problem-solving on the near environment and wider ecosystem; major issues regarding the human and material resources of future generations and the role of home economics in confronting and dealing with these major issues.

FD NU 220. *Food Preparation.* ★3 (Second Term, 3-0-3). An introductory course in food handling and preparation, emphasizing and comparing market forms of foods. Prerequisite: Chemistry 30 or consent of instructor.

FD NU 221. *Food Preparation.* ★3. (Second Term, 3-1s-0). An introductory course in food handling and preparation, emphasizing and comparing market forms of foods. Prerequisite: Chemistry 30 or consent of the instructor. Note: Credit may not be obtained for both FD NU 220 and 221, FD NU 221 is not acceptable as the Foods requirement for Family Studies students.

FD NU 222. *Current Topics in Human Nutrition and Foods.* ★3 (First Term, 3-0-0). An introductory course. Selected problems in community nutrition in developed and developing countries. Prerequisite: Chemistry 30 or consent of the instructor. Note: Not open to students who have credit in FD NU 325, 327, 464 or 465.

FD NU 320. *Basic Foods I.* ★3 (First Term, 3-0-3). Studies of the chemical, physical and sensory properties of carbohydrates present in foods with application to the preparation of foods in the home and institution. Prerequisite: CHEM 250.

FD NU 321. *Basic Foods II.* ★3 (Second Term, 3-0-3). Studies of the chemical, physical and sensory properties of proteins and fats present in foods with application to the preparation of foods in the home and institution. Prerequisite: CHEM 250.

FD NU 323. *Socio-Cultural Aspects of Foods.* ★3 (Second Term, 3-0-3). Food habits as influenced by historical, geographical,

cultural and economic factors. Implications of these on food purchasing, meal planning and nutrition. Prerequisite: FD NU 320 or consent of the instructor.

FD NU 325. *Introductory Nutrition I.* ★3 (First Term, 3-0-3). A study of carbohydrates, fats and proteins, and the role which minerals and vitamins play in their metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent.

FD NU 326. *Introductory Nutrition I.* ★3 (First Term, 3-0-0). A non-laboratory course in nutrition. Lectures are the same as FD NU 325. Selected reading from the literature will be required. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent. Credit may not be obtained for both FD NU 325 and FD NU 326.

FD NU 327. *Introductory Nutrition II.* ★3 (Second Term, 3-0-3). Emphasis will be on minerals and vitamins; their chemical and physiological roles in metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: FD NU 325.

FD NU 328. *Introductory Nutrition II.* ★3 (Second Term, 3-0-0). A non-laboratory course in nutrition. Lectures are the same as FD NU 327. Selected reading from the literature will be required. Prerequisite: FD NU 325 or 326. Credit may not be obtained for both FD NU 327 and 328.

FD NU 406. *Clinical Dietetics.* ★3 (Second Term, 3-0-3). Basic principles of nutrition in clinical situations. The role of diet in the management of various diseases. The laboratory sessions include practical experience in interviewing patients. Prerequisite: FD NU 464. Corequisite: FD NU 465 or consent of the instructor.

FD NU 427. *Consumer Acceptance of Foods.* ★3 (First Term, 3-0-3). Factors influencing consumer acceptance of foods with special reference to food safety, quality control, toxicological implications of intentional and incidental food additives and implications of product development for the consumer. Prerequisite: FD NU 320 and 321 or consent of the instructor.

FD NU 429. *Experimental Foods.* ★3 (First Term, 3-0-3). Application of the experimental method to food problems. Sensory and objective evaluation of food properties. Development of an individual research problem. Prerequisite: FD NU 320 and 321 or consent of the instructor.

FD NU 461. *Institutional Management I.* ★3 (First Term, 3-0-4). Operational techniques and special problems encountered in the food service industry. The laboratory sessions will provide experience in quantity food production. Prerequisite: FD NU 320 and 321 or consent of instructor.

FD NU 463. *Institutional Management II.* ★3 (Second Term, 3-0-0). Application of principles of management to the food service industry.

FD NU 464. *Nutrition.* ★3 (First Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on energy, carbohydrates, fats and proteins. Prerequisite: BIOCH 300.

FD NU 465. *Nutrition.* ★3 (Second Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on vitamins and minerals. Prerequisite: BIOCH 300.

FD NU 466. *Project Course.* ★3 (either term, 0-0-6). Advanced library and laboratory study with a written report on selected problems in human nutrition or foods. Prerequisite: Consent of the instructor.

FD NU 504. *Experimental Techniques.* ★3 (either term, 0-0-6). Application of chemical methods and bioassays to research in nutrition. Prerequisite: CHEM 312.

FD NU 506. *Clinical Dietetics.* ★3 (First Term, 3-0-3). The principles of diet therapy in selected areas of current interest. Emphasis on case studies, research and practical problems in diet therapy. Prerequisite: FD NU 406.

FD NU 507. *Nutrition in the Community.* ★3 (Second Term, 3-0-3). Examination of nutrition problems in contemporary communities. The application of basic concepts of food and nutrition to community nutrition problems. Discussion of nutrition programs and resources. Prerequisite: FD NU 464 and 465 or 325 and 327.

FD NU 508. *Advanced Nutrition.* ★3 (First Term, 3-0-0). A lecture and reading course. Prerequisite: FD NU 464 and 465 or consent of instructor.

FD NU 509. *Advanced Nutrition.* ★3 (Second Term, 3-0-0). A lecture and reading course. Prerequisite: FD NU 464 and 465 or consent of instructor.

FD NU 510. *Food Safety and Hygiene.* ★3 (Second Term, 3-0-0). The rationale of Public Health, Consumer and Corporate Affairs and Food and Drug regulations related to Foods and Nutrition, with special emphasis on institution management. Care and handling of foods in the retail store, institution and the home. Prerequisite: FD SC 461 or consent of the instructor.

FD NU 511. *Advanced Foods.* ★3 (Second Term, 3-0-0). Quality characteristics of foods. Current scientific information about foods used in the home and institutions with emphasis on quality factors such as color, texture and flavor. Prerequisites: FD NU 320, 321, and BIOCH 300 or consent of the instructor.

FD NU 600. *Foods and Nutrition Seminar.* ★0 (Both Term, 0-1s-0). Required both terms of all graduate students.

FD NU 602. *Research Project in Nutrition or Foods.* ★3 (either term, 0-0-6).

FD NU 603. *Further Research in Nutrition or Foods.* ★3 (either term, 0-0-6).

94.14 Microbiology

MICRB 315. *General Microbiology I.* ★3 (either term, 3-0-3). The organization, morphology and cell structure of microorganisms with emphasis on bacteria and fungi. Microbial growth and its control, aspects of medical and applied microbiology and microbial ecology will be discussed. Laboratory exercises are designed to demonstrate basic microbiological techniques as well as relevant microbial activities and functions.

MICRB 365. *General Microbiology II.* ★3 (Second Term, 3-0-3) An introduction to the metabolic and physiological activities o microorganisms with emphasis on their interactions with othe microorganisms, higher plants, animals and the environment Discussion of the mode of action of antibiotics and othe metabolic inhibitors and the basic properties of viruses, viru infection and replication. Laboratory exercises are designe to introduce students to current techniques and phenomen related to the lecture material. Prerequisites: MICRB 315 BIOL 297, or GENET 351. Corequisite: BIOCH 300 (or equiva lent) or consent of the Department.

94.15 Organization Theory

Faculty of Business Administration and Commerce

ORG T 303. *Behavior in Organizations.* ★3 (either term, 3-0-0 Examines the sociological and psychological bases of indivi ual behavior in organizations. Topics of individual psycholog examined will include cognition, perception, attitude formatic and change, personality structure and change, and motivatio The course will also investigate the behavior of individuals groups and organizations. In this context various aspects group dynamics such as leadership, communicatio interpersonal sensitivity, morale and satisfaction, and the fo mation and attainment of individual and group goals will b discussed.

ORG T 421. *Theory and Practice of Personnel Administration* ★3 (either term, 3-0-0). Philosophy and procedures in obtai ing and maintaining an efficient work force with emphasis o the methods of initiating and carrying out an effective ma power management program. Includes recruitment, selectio utilization, and development of human resource Prerequisites: ORG T 303, 305, or equivalent.

ORG T 422. *Theory and Practice of Personnel Administration* ★3 (Second Term, 3-0-0). Focus on the development and a ministration of programs for job analysis; job evaluation; wa surveys; wage and salary systems and administration; pe formance standards; performance analysis and evaluatio employee services and fringe benefits. Prerequisite: ORG 421.

94.16 Physiology

PHYSL 410. *Physiology.* ★6 (3-0-3; 3-0-0). Available for graduate and science students. Prerequisites: BIOL 130 or 299, CHEM 200, and 250 or 350.

94.17 Psychology

Note: Students with credit in Psychology 202, 212 or ED PSY 269/271 may not take PSYCO 260/261 for degree credit.

PSYCO 260. *Basic Psychological Processes.* ★3 (either term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 261. *Individual and Social Behavior.* ★3 (either term, 3-0-0). Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be included. Prerequisite: PSYCO 260.

PSYCO 309. *Statistical Methods for Psychological Research.* ★3 (either term, 3-0-1). Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of sampling theory and tests of statistical hypotheses. Prerequisite: Mathematics 30, MATH 100, or consent of the Department.

PSYCO 383. *Personality.* ★3 (either term, 3-0-0). An introductory survey including representative theoretical points of view and research relevant to major problems of the study of personality. Prerequisite: PSYCO 260/261 or equivalent.

94.18 Sociology

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 311. *Statistics and Social Research.* ★6 (3-0-2). Research design, data collection, and data processing in the social sciences. Logic and interpretation of statistical concepts and methods; measures of central tendency, variability and relationships; sampling and tests of hypotheses. Techniques of social measurement, experimental design and introduction to scaling. Note: Accepted as a science course in B.A. programs.

SOC 341. *Social Psychology.* ★3 (either term, 3-0-1). An introduction to the study of individual and group behavior observed in social processes. Prerequisite: SOC 202 or 403 or PSYCO 260/261 or EDPSY 269/271. Note: SOC 341 and PSYCO 341 may *not* both be taken for credit.

SOC 367. *Values and Belief Systems.* ★3 (either term, 3-0-0). The origins, developments, and social consequences of systems, of beliefs and values. Prerequisite: SOC 202 or 403.

SOC 371. *The Family.* ★3 (either term, 3-0-0). Structure and function of the family system, historically and cross-culturally. The family system in contemporary societies emphasizing its institutional characteristics and current trends. Prerequisite: SOC 202 or 403. Not open to students who have credit in FAM 241 or 350.

Interdisciplinary Studies

97 INTRODUCTORY

97.1 Members

97.1.1 OFFICERS

Dean
G. S. H. LOCK, B.Sc., Ph.D.

Administrative Assistant
E. M. SHARP

97.1.2 ACADEMIC STAFF

BOREAL INSTITUTE FOR NORTHERN STUDIES

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R. S. JAMIESON

Librarians
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B. L. CHAWNER, B.Sc., M.L.S.

CANADIAN INSTITUTE OF UKRAINIAN STUDIES

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Assistant Professor
A. J. HORNJATKEVYC, A.B., A.M., Ph.D.

Visiting Assistant Professors
J. P. HIMKA, B.A., M.A., Ph.D.
B. A. KRAWCHENKO, B.A., M.A.

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Professors
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W. W. ROZEBOOM, B.S., Ph.D.

Professional Officer
L. P. MOS, B.A., M.Sc., Ph.D.

CENTRE FOR THE STUDY OF MENTAL RETARDATION

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DEVONIAN BOTANIC GARDEN

Director
P. N. D. SEYMOUR, B.Sc.

Research Associate
R. S. CURRAH, B.Sc., M.Sc.

DIVISION OF COMMUNITY DEVELOPMENT

Associate Professor and Acting Director
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Professor
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DIVISION OF EAST EUROPEAN STUDIES

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Associate Professor
T. YEDLIN, B.Ed., M.A., Ph.D.

WATER RESOURCES CENTRE

Professor and Director
A. H. LAYCOCK, B.A., Ph.D.

97.1.3 ADVISORY COUNCIL

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Dean of Graduate Studies and Research
J. FORSTER, B.A., M.A., Ph.D.

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J. P. HIMKA, B.A., Ph.D.
A. J. HORNJATKEVYC, A.B., A.M., Ph.D.
W. W. ROZEBOOM, B.S., Ph.D.
D. G. WANGLER, B.S., M.A., Ph.D.
T. YEDLIN, B.Ed., M.A., Ph.D.

Graduate Student Representatives
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T. SITTLER, B.A.
T. STEWART, B.A.

Faculty Representatives
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R. S. FRASER, B.Sc., M.D., M.Sc., F.R.C.P.(c), F.A.C.P.
S. M. A. HAMEED, B.A., M.A., Ph.D.
N. C. KEATING, B.A., M.A., Ph.D.
Y. J. KINGMA, Natlr.
S. KUMAR, B.Sc., M.Sc., Ph.D.
W. J. KURMEY, B.Sc., A.M.(L.S.)
H. T. LEWIS, A.B., Ph.D.
R. N. MacGREGOR, S.D.A., B.Ed., M.Ed., Ph.D.
E. P. MENDES, LL.B., LL.M.
G. E. MYERS, B.Sc., M.Sc., Ph.D.
C. H. PEARSON, B.Sc., Ph.D.
W. M. SCHULTZ, Dipl.Agr., Dr. Landwirtschaft, Ph.D.
G. S. SWINNERTON, B.A., M.A., Ph.D.

97.2 General Information

The greater part of activity at the University stems from the existence of a multitude of well-defined disciplines: in arts, science, medicine, etc. Such uni-disciplinary activities reflect the contemporary structure and organization of knowledge, and acknowledge the demand for education and research in time-honored subjects. A small part of University activity is devoted to the pursuit and application of knowledge in several disciplines simultaneously.

Disciplines come together in two principal ways. Firstly, they can come together within an organization specifically designed to accomplish a stated mission: in this form, the disciplines are coordinated but are otherwise independent. This type of activity is often described as *multi-disciplinary*. Secondly, they can come together in a fundamental merger in which they may lose their separate identities and evolve into a new discipline, *sui generis*. Such activity is usually described as *interdisciplinary*.

Interdisciplinary Studies embraces both of the above forms and therefore reflects the University's proper concern with societal and epistemological problems. This concern expresses itself in courses, programs, research projects, and public service. Opportunities are outlined in the separate descriptions of the institutes, centres, and divisions listed below. The only restrictions are that work should involve more than one faculty, and must meet the requirements of the Faculty of Graduate Studies and Research.

98 INTERDISCIPLINARY STUDIES

98.1 Boreal Institute for Northern Studies

Director
R. S. JAMIESON

Advisory Board
N. W. RUTTER, Ph.D., Chairman
L. CARBYN, Ph.D.
H. F. CLIFFORD, Ph.D.
G. DACKS, Ph.D.
K. E. DENFORD, Ph.D.
J. H. ENGLAND, Ph.D.
G. F. N. FEARN, Ph.D.
G. GERARD, Ph.D.
A. K. HELLUM, Ph.D.
J. PARKER, M.A.
W. G. PEARCE, M.D., F.R.C.S.
C. E. SCHWEGER, D.Phil.

The Boreal Institute has as its prime objective the gathering and dissemination of information about the North in an effort to increase understanding and awareness of that part of Canada. To achieve this goal, the Institute has adopted a three-fold program: the implementation and fostering of research about the North, the development of a library and information centre, and the provision of training and instruction.

The research aspect of the Institute's activities includes annual grants awarded in support of short-term northern research projects; one program for graduate students and another for faculty members. Longer term and more comprehensive research programs are also operated under the aegis of the Institute, for example, the Northwest Territories Local Government Training Program. The Institute has in place several contract research programs undertaken at the request of federal and territorial government departments. The Yukon Bibliography, which is supported by the Yukon Territorial Government, is one of the Institute Library's ongoing projects. The fifth volume, Update to 1979, will be published in the fall of 1980.

The Institute has established and maintains a multi-disciplinary library and information centre, which is a distinct and separate collection from that of the University as a whole. It serves the needs of all interested in obtaining information on northern regions. The collection covers northern Alberta, the Canadian arctic, the mid-Canada corridor, Alaska, the Arctic Ocean, and all circumpolar countries. Subjects range from fiction and popular articles to highly scientific publications. The Library subscribes to newspapers and newsletters from communities north of 60 and to those published by the native peoples of Canada, as well as to all periodicals concerning northern regions.

An increasingly important function of the Boreal Institute is its provision of northern schools. The Eastern Arctic Winter School, the Arctic Summer School, and the Yukon Summer School are offered jointly with the Faculty of Extension. These schools are designed for management and professional people working in private and public organizations which are active or becoming active in the North. Their objective is to familiarize those working or advising on northern operations with special social and environmental conditions in those parts of Canada. Those wishing further information about the northern schools should contact the Faculty of Extension, Corbett Hall, University of Alberta, Edmonton, Alberta, T6G 2G4.

The Boreal Institute, with the cooperation of the Department of Geography, offers a graduate seminar which examines current environmental research in Canada's North. (Also see § 184.15 of the Faculties of Arts and Science calendar and § 99.2 of this calendar.) The Institute also maintains active liaison with all faculties offering courses in northern studies.

The Institute is located in Room CW 401, Biological Sciences Building. Inquiries regarding the work of the Institute should be addressed to the Office of the Director, while information concerning the Library of the Institute, including its reference service, can be obtained from the Insitute's Librarian.

98.2 Canadian Institute of Ukrainian Studies

Director
M. R. LUPUL, Ph.D.

Associate Directors
G. S. N. LUCKYJ, Ph.D. (Toronto)
B. R. BOCIURKIW, Ph.D. (Carleton)

Advisory Council
R. L. BUSCH, Ph.D.
B. A. KRAWCHENKO, M.A.

D. V. PARKER, Ph.D.
T. M. S. PRIESTLY, Ph.D.
I. L. RUDNYTSKY, Ph.D.
A. D. RUTKOWSKI, M.A.

The Canadian Institute of Ukrainian Studies was established in 1976 as a national institution to help meet the academic needs of Ukrainians in Canada. Its objectives are: (i) to encourage program development in Ukrainian studies at the undergraduate and graduate levels; (ii) to serve as a resource centre for English-Ukrainian bilingual education; (iii) to encourage and coordinate research and publications in Ukrainian studies; (iv) to encourage contacts among scholars and students in Ukrainian studies through seminars and conferences.

The Institute offers no courses or degree programs. Its main concern is to strengthen, expand, and coordinate department-based programs to prevent unnecessary duplication, especially at the graduate level and where research and publications are concerned. At the graduate level specialization is through theses on Ukrainian or Ukrainian-Canadian topics. Otherwise, the Institute encourages an interdisciplinary approach in the context of East European, Soviet, and/or Canadian studies. An important concern of the Institute is to develop an awareness of the past and present state of Ukrainian life in Canada and elsewhere among students capable of meeting the needs of schools, universities, governments, and the Ukrainian-Canadian community as a whole.

The Institute's undergraduate scholarships and graduate fellowships may be held by a Canadian citizen or a permanent resident (landed immigrant) in any Canadian university or elsewhere. While the Institute contracts research beyond Canada's borders, requests for its research grants are accepted only from Canadian citizens and permanent residents (landed immigrants).

The Institute has two series of publications: The Alberta Library in Ukrainian-Canadian Studies and The Canadian Library in Ukrainian Studies. Emphasis is on bibliographic works, collections of primary documents, monographs, and on nineteenth- and twentieth-century intellectual and social developments in Ukraine. To aid in research and publication the Institute has an office at the University of Toronto and close liaison with the Shevchenko Scientific Society at Sarcelles (near Paris). The former is concerned to improve teaching of Ukrainian literature and language at the university level, and both are engaged in the preparation of a basic text for a four-volume alphabetical encyclopaedia of Ukraine in English to be published by the Canadian Foundation for Ukrainian Studies. The Institute accepts funds on behalf of the Foundation, and all expenditures are coordinated by the Institute. The Toronto office publishes a semi-annual *Journal of Ukrainian Studies* containing notable seminar papers, dissertation abstracts, and parts of theses. Other activities include the development of a visiting professor's program, a Ukrainian Studies Summer School, a student research and travel-study program, and organization of the annual Shevchenko lecture.

The Institute is under the jurisdiction of the Dean of Interdisciplinary Studies. Policy is developed by the Director, assisted by two Associate Directors; the Advisory Council helps to promote the interdisciplinary dimension of Ukrainian Studies at The University of Alberta; and the Council of Associates, consisting of the most senior personnel in Ukrainian Studies in Canada, helps to implement the inter-university function of the Institute. Inquiries should be addressed to the Director of the Institute.

98.3 Center for Advanced Study in Theoretical Psychology

Director
J. R. ROYCE, Ph.D.

Professional Officer
L. P. MOS, Ph.D.

Staff
W. J. BAKER, Ph.D.
W. W. ROZEBOOM, Ph.D.
H. TENNESSEN, D.Phil.

Research Associates
A. POWELL, Ph.D.
B. VOORHEES, Ph.D.

Faculty Associates
T. E. WECKOWICZ, Ph.D.
K. V. WILSON, Ph.D.

Faculty Affiliates
R. JUNG, Ph.D.
H. GARFINKLE, Ph.D.

Sabbatical Resident (1980-81)
J. R. BARCLAY, Ph.D., (U.S.A.)

The Center for Advanced Study in Theoretical Psychology offers a program of education and research into the theoretical foundations of psychological science. Attempts are made to trace the historical continuities and logical structure of psychology's central concepts, to contribute to the development of substantive theory, and to identify the unities underlying the diversity of current psychological work.

The Center is designed to provide a setting for the development of advanced skills in methodological analysis combined with breadth of integrative comprehension in psychology. Faculty and students are offered seminars, informal interactions with staff and visiting scholars, and special courses of instruction.

Through the Distinguished Visiting Scholars Program, internationally recognized scholars in theoretical-philosophical psychology are brought to the Center for periods of one- to two-weeks. Sessions are devoted to critical examination of the visitor's work. This program is co-ordinated with an annual theme and a subsequent conference at Banff. All members of the Center are expected to participate in its seminars.

Graduate participants enroll in one of the regular Ph.D. programs offered by the Department of Psychology, while postdoctoral programs are tailored to individual specifications. Inquiries should be addressed to the Professional Officer of the Center.

98.4 Centre for the Study of Mental Retardation

Director
J. P. DAS, Ph.D.

Research Associates
G. BISANZ, Ph.D.
F. SNART, Ph.D.

Editor of Mental Retardation Bulletin
A. E. WALL, Ph.D.

Course Co-ordinator
R. MULCAHY, Ph.D.

Co-ordinators of Resources for the Dependent Handicapped Project
G. M. KYSELA, Ph.D.
C. NORMAN, Ph.D.

Co-ordinator of Staff and Parent Training Program
G. M. KYSELA, Ph.D.

Chairman of the Advisory Board
P. BOWEN, M.D.

The objectives of the Centre for the Study of Mental Retardation are:

(i) to pursue research of an interdisciplinary nature into the problems of intellectual subnormality;

(ii) to encourage faculty and graduate students to carry out investigations in the field of mental retardation; and

(iii) to provide facilities for clinical investigation and remediation of the child with learning handicaps from biomedical, educational, and psychological aspects, and to provide interdisciplinary training for students in these areas.

The Centre seeks grants from government agencies and private organizations for research and demonstration projects so as to understand the nature of intellectual subnormality and learning disorders, and to devise methods for their prevention and treatment. The Centre publishes a journal, *Mental Retardation Bulletin*, three times a year. Policy for the Centre is established by an interdisciplinary advisory board responsible to the Vice-President (Academic) of the University.

98.5 Devonian Botanic Garden

Director
P. N. D. SEYMOUR, B.Sc.

Associate Director and Chairman of Advisory Committee
P. R. GORHAM, Ph.D., D.Sc.

Research Associate
R. S. CURRAH, B.Sc., M.Sc.

The Devonian Botanic Garden was founded in 1959 on 80 acres of land near Devon donated by the late H. A. Dyde, Q.C., LL.D., O.B.E. It has been developed on naturalistic lines. Part of it is a nature conserve, and there are two ecological reserves.

The aims and objectives of the Devonian Botanic Garden include the following:

1. To establish a collection of cultivated plants hardy in the Edmonton region and to establish a collection of indigenous plants of Alberta, both for University teaching and public education.

2. To conduct plant introduction and winter hardiness trials with the aim of increasing the range of plants grown in the Edmonton region.

3. To seek out variations in native materials suitable for introduction as ornamental plants.

4. To construct a garden of plants used by the native peoples of Alberta.

5. To take part in the International Seed Exchange with some 400 world-wide institutions and botanic gardens.

6. To provide outdoor laboratory space for the University and other institutes of learning.

7. To conduct taxonomic and applied research into ornamental plants and to maintain a herbarium of cultivated plants.

8. To enable the public to become aware of, and appreciate, one of the many aspects of the extension work of the University in a congenial setting.

9. To encourage public interest in, and support for, the Garden by means of the Friends of the Devonian Botanic Garden.

10. To publish informative bulletins.

The Devonian Botanic Garden is situated 9.5 kilometres west of Edmonton on Highway 16 and 14.5 kilometres south on Highway 60.

98.6 Division of Community Development

Acting Director
A. S. A. MOHSEN, Ph.D.

Professor
G. A. EYFORD, Ph.D.

Associate Professor
D. G. WANGLER, Ph.D.

The Degree of M.A.

(1) Candidates enrolled in this program must have a general background in the social sciences and relevant humanities, with special emphasis on senior-level proficiency in anthropology, economics, social psychology, sociology, and political science. Most students applying for admission to this program will take an initial year as a qualifying graduate student to bring their general background in the social sciences and relevant humanities at the senior undergraduate level up to the requirements. However, students entering the program with an honors degree in a relevant field or with equivalent preparation in the core areas, can be considered as candidates for the Master's degree.

(2) The Division offers two routes for the M.A. degree, a thesis route and a non-thesis route:

(a) The thesis route: Over the two-year period students will be expected to take the equivalent of at least five and one-half full-session courses; three and one-half of which are graduate level courses and more than half of which are mandatory. Students in this route will then write a thesis equivalent to two full-session courses. The mandatory courses include the core courses of the program which are intended to give the student a definitive and comprehensive view of community development principles and practices. INT D 459 is a prerequisite for all the mandatory courses. INT D 559 must be taken in the first year; INT D 601 and INT D 602 must be taken in the second year.

(b) The non-thesis route: Over the two-year period students will be expected to take the equivalent of at least six and one-half full-session courses; four of which are graduate level courses and more than half of which are mandatory. Students in this route will then take INT D 900 which is the non-thesis project.

The balance of each student's program is made up of courses chosen from other departments and faculties, depending upon his or her special interests. Areas which are highly recommended include: (1) social science research methods, (2) adult education, (3) group dynamics, and (4) development and change (relevant courses in anthropology, economics, education, organizational development, philosophy, and rural and urban sociology). Other courses are offered by Geography, History, Political Science, Recreation Administration, and Education. Where students' special interests are not met by existing courses, conference (or reading) courses or practicums can be arranged under the supervision of a staff member with competence in that particular field.

(3) For additional information regarding this program, including the availability of assistantships, students should contact the Director, Division of Community Development, Room 748, Education Building South, University of Alberta, Edmonton, Alberta T6G 2E1. Such inquiries should be made as early as possible, particularly by students who wish to begin acquiring the necessary prerequisites through Spring or Summer Session courses.

98.7 Division of East European Studies

Director
R. L. BUSCH, Ph.D.

Associate Professor
T. YEDLIN, Ph.D.

Advisory Council
B. BAIN, Ph.D. (Educational Psychology)
R. L. BUSCH, Ph.D. (Slavic Languages)
H. GARFINKLE, Ph.D. (Educational Foundations)
C. HALE, Ph.D. (Germanic Languages)
L. A. KOSINSKI, Ph.D. (Geography)
H. KREISAL, Ph.D. (Canadian Studies)
K. KROTKI, Ph.D. (Sociology)
M. R. LUPUL, Ph.D. (Ukrainian Studies)
S. W. MENDRYK, Ph.D. (Physical Education)
I. MORAVCIK, Ph.D. (Economics)
M. MOTE, Ph.D. (Political Science)
E. MOZEJKO, Ph.D. (Comparative Literature)
E. REINHOLD, Ph.D. (Acting Associate Dean of Arts)
I. RUDNYTSKY, Ph.D. (History)

The aims of the Division of East European Studies are:

1. the promotion and co-ordination of studies, research and publications, dealing with Eastern Europe, the Soviet Union and East European peoples in Canada, and the building up of library and other facilities relevant to this area of study;

2. the development of interdisciplinary graduate programs in East European studies;

3. the development of honors or other undergraduate programs;

4. the arrangement and sponsorship of conferences, symposia, colloquia, academic exchanges, and inter-university projects;

5. the development of a centre for student and community groups interested in Central and East European studies, including studies in Canadian contexts; and

6. the fostering of public awareness of Eastern Europe and the role played by Canadians of Eastern European origin in Canada's development.

Programs leading to degrees with notation of specialization in East European and Soviet Studies are offered jointly by the Division and any one of the following departments: the Departments of Comparative Literature, Economics, Educational Foundations, Educational Psychology, Geography, History, Physical Education, Political Science, Sociology, and Slavic Languages.

The basic graduate M.A. and M.Ed. programs consist of area-related study in a department, the interdisciplinary seminar on Eastern Europe and the Soviet Union (INT D 546), and a thesis written on an East European or Soviet topic or on East Europeans in Canada. The student must demonstrate competency in one of the languages of the area. Unless waived on the basis of previous study or background, students are also required to include in their programs an area-related full course or two half-courses from outside their department. Additional information on East European and Soviet Studies graduate courses and programs is to be found in § 203.1.2 (6) and § 204.23 of the Faculty of Graduate Studies and Research Calendar.

An Honors degree with an East European and Soviet Studies specialization can be taken through one of the Departments of Economics, History, Political Science, or Slavic Languages. These special programs are designed by the department concerned, in conjunction with the Dean of Arts Office. Programs may include area-related courses listed in the Faculty of Arts Calendar under Comparative Literature, Economics, Geography, History, Political Science, the various Slavic Languages, Interdisciplinary Courses, and the Faculty of Education Calendar. These programs must include an approved language component. Further information may be obtained from the Office of the Dean of Arts.

A summer travel-study course to the USSR and East Europe is organized by the Division. Its purpose is to provide first-hand experience with cultures and life in one or more European socialist countries.

The Division maintains close liaison with the Central and East European Studies Society of Alberta (CEESSA), a community-academic educational society open to all Albertans, and co-sponsors with it a series of public lectures and conferences on Central and East European studies.

An interdisciplinary dimension to Ukrainian studies in the East European, Soviet, and/or Canadian context is encouraged and promoted by the Canadian Institute of Ukrainian Studies (see § 98.2).

Address inquiries to: Dr. R. L. Busch, Director, Division of East European Studies, 300 Athabasca Hall, University of Alberta, Edmonton, Alberta T6G 2E8.

98.8 Water Resources Centre

Director
A. H. LAYCOCK, Ph.D.

The Water Resources Centre was established in 1969. Its objectives are the enhancement of orderly growth of basic and applied water resources research at The University of Alberta by securing exchange and co-operation among researchers from different scientific disciplines relevant to water resources, by encouraging response of the University to public needs through applied research, and by developing and maintaining a coordinated research capability in water resources. Stimulation of public interest and improved communication in water resources research is attempted by the publication of books and reports, and by arranging for conferences, seminars, and other activities.

The Centre seeks grants from government agencies and private organizations for research. Staff and students with interests in water resources research and management are encouraged to become involved.

99 DETAILS OF COURSES

99.1 General Information

In the following list of courses, each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of each course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT OR DIVISION CONCERNED.

99.2 Boreal Institute for Northern Studies

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). An examination of current environmental research in the Canadian North. Seminars are presented by professionals engaged in various facets of northern research. Prerequisite: Consent of the instructor. (Offered by the Boreal Institute for Northern Studies and the Department of Geography.) Students register in the Department of Geography.

99.3 Division of Community Development

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). The history, origins, foundation and definitions of community development. (Registration in this course is handled by the Department of Sociology.)

INT D 506. *Community Development Field Methods and Techniques.* ★3 (either term, 3-0-0). Practical training in field methods and techniques related to the principles and practices of community development, for example: Strategies of Involvement and Participation, Small Group and Large Group Skills, Program Planning, Community Analysis, The Use of Communications and Mass Media. Prerequisite: Consent of Division.

INT D 509. *Conference Course in Community Development.* ★3 (either term, 3-0-0). Prerequisite: Consent of Division.

INT D 510. *Community Development Practicum.* ★3 (either term, 3-0-0). Prerequisite: Consent of Division.

INT D 516. *Learning in the Community.* ★3 (either term, 3-0-0). An examination of how and what people learn in a community through mass media, institutions and organizations, traditions and customs, popular culture, advertising, etc. The value of information and knowledge in the development of a community will be explored and assessed. Prerequisite: Consent of Division.

INT D 559. *Theories of Community Development.* ★3 (either term, 3-0-0). A study of the major theories of community development with respect to their philosophy and their methodology. The relative merits of various approaches to community development will be examined and discussed. Prerequisite: INT D 459 or equivalent.

INT D 601. *Comparative Community Development.* ★3 (First Term, 3-0-0). A detailed study of the application of community development theories in specific projects; a survey and evaluation of representative programs in community development in Canada and elsewhere. Prerequisite: INT D 459 or equivalent.

INT D 602. *Current Issues in Community Development.* ★3 (Second Term, 3-0-0). An examination of current social problems and their relevance to community development theory and practice; the relevance to community development approaches to contemporary community development problems. Prerequisite: INT D 459 or equivalent.

INT D 900. *Non-Thesis Project.* ★3 (either term, variable). Note: for Community Development students enrolled in the non-thesis M.A. Program. Prerequisite: Consent of Division.

99.4 Division of East European Studies

SENIOR COURSES

INT D 341. *Romania and Romanians.* ★3 (Second Term, 3-0-0). Included in the course is the history of Romania, the nature of its language, and the social, political, cultural and economic development of Romania, and of Romanian settlements, especially those in the Moldavian SSR and in Canada.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). An interdisciplinary introduction to the study of the socialist system with special reference to the Soviet Union and East Europe. (Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, and Sociology.)

INT D 347. *Women and Socialism: USSR and Eastern Europe.* ★3 (Second Term, 3-0-0). Theory and practice of socialism as related to the status of women in Eastern Europe and the Soviet Union. Prerequisite: Consent of the Division of East European Studies. Note: Not open to students who have taken POL S 342 in 1977-78. (Division of East European Studies and Departments of Political Science and Sociology.)

INT D 355. *Social Problems of Eastern Europe Under State Socialism.* ★3 (First Term, 3-0-0). The socio-cultural and economic consequence of major structural transformations in East European societies, with particular emphasis on family life, the socialization of youth, work relations, popular culture, and social deviance. (Division of East European Studies and Departments of Slavic Language and Sociology.)

INT D 443. *The Soviet North and Siberia.* ★3 (Second Term, 3-0-0). The economy, political administration, and the social development of the native peoples of Siberia and the Soviet North. Prerequisite or corequisite: An area-related course in one of geography, political science, economics, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies and Departments of Anthropology, Economics, and Geography.)

INT D 444. *The Ukraine.* ★3 (Second Term, 3-0-0). Major social economic, political, and cultural trends in the Ukrainian SSR in the post-World War II period. Prerequisite or corequisite: An area-related course in one of geography, history, political science, or Ukrainian, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies and Departments of History and Slavic Languages.)

INT D 445. *Poland.* ★3 (First Term, 3-0-0). The political, social economic, and cultural developments in post-World War II Prerequisite: INT D 346, or POLSH 304 or equivalent, or demonstration to the Division of East European Studies of sufficient background in the area. (Participating units normally include Division of East European Studies and Departments of Economics, Fine Arts, Geography, Slavic Languages, and Sociology.)

INT D 446. *Eastern Europe: A Travel-Study Course.* ★6 (5-0-15) An intensive interdisciplinary study of Eastern Europe and the

Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Spring or Summer Session in countries of Eastern Europe and the USSR on a selected basis and includes intensive study in one or more countries. Prerequisite: INT D 346, or consent of the Division of East European Studies. Pre-session study and preparation.

HONORS AND GRADUATE COURSES

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar. (Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, and Sociology.)

99.5 Interdisciplinary (INT D) Courses Offered at The University of Alberta

INT D 230. *Practical Plant Biology.* ★3 (First Term, 3-0-3). The practical aspects of plant structure and classification. Laboratory exercises will emphasize crop plants. Prerequisite: Biology 30 or BIOL 130. (Offered jointly by the Departments of Botany and Plant Science.) Students register in the Department of Plant Science.

INT D 300. *Introduction to the Study of Film.* ★6 (3-0-3). An interdisciplinary survey (lecture and laboratory) of major areas in film studies, emphasizing history, theory, and criticism. Prerequisite: 1 year of ENGL 200-level, or ART H 201 and 202, or C LIT 200 or 300, or PHIL 240, or equivalent. Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option. (Departments of Art and Design, Comparative Literature, Drama, English, Philosophy, Political Science, and Romance Languages.) Students register in the Department of Philosophy.

INT D 301. *The Hollywood Film.* ★6 (3-0-3). A survey of the American feature film from the silent era to the present. Prerequisite: INT D 300. Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option. (Departments of Art and Design, Comparative Literature, Drama, English, Philosophy, Political Science, and Romance Languages.) Students register in the Department of Philosophy.

INT D 302. *Economics of Agriculture.* ★3 (either term, 3-0-0). The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relations of the agricultural sector to the economy as a whole; analysis of structural change, economic growth, and adjustment in agriculture. Prerequisites: ECON 201/202 or equivalent. (Offered jointly by the Departments of Economics and Rural Economy.) Students register in the Department of Rural Economy.

INT D 303. *Economics of World Agriculture.* ★3 (either term, 3-0-0). A survey of world structure of agricultural production, consumption, and trade; international agricultural policies and agreements; impact of regional economic integration on agriculture; interrelation of economic development and trade in agricultural commodities. Prerequisites: ECON 201/202 or equivalent. (Offered jointly by the Departments of Economics and Rural Economy.) Students register in the Department of Rural Economy.

INT D 341. *Romania and Romanians.* ★3 (Second Term, 3-0-0). Included in the course is the history of Romania, the nature of its language, and the social, political, cultural and economic development of Romania, and of Romanian settlements, especially those in the Moldavian SSR and in Canada. Students register in the Division of East European Studies.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 (3-0-0). An interdisciplinary introduction to the study of the socialist system with special reference to the Soviet Union and East Europe. (Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, and Sociology.) Students register in the Division of East European Studies.

INT D 347. *Women and Socialism: USSR and Eastern Europe.* ★3 (Second Term, 3-0-0). Theory and practice of socialism as related to the status of women in Eastern Europe and the Soviet Union. Prerequisite: Consent of the Division of East European Studies. Note: Not open to students who have taken POL S 342 in 1977-78. (Division of East European Studies and Departments of Political Science and Sociology.) Students register in the Division of East European Studies.

INT D 355. *Social Problems of Eastern Europe Under State Socialism.* ★3 (First Term, 3-0-0). The socio-cultural and economic consequences of major sructural transformations in East European societies, with particular emphasis on family life, the socialization of youth, work relations, popular culture, and social deviance. (Division of East European Studies and Departments of Slavic Languages and Sociology.) Students register in the Division of East European Studies.

INT D 356. *Sociology of Rural Life.* ★3 (either term, 3-0-0). The rural community and rural social systems, with special reference to changes in the rural way of life. Prerequisite: R SOC 355, or SOC 202 or 403, or equivalent. (Offered jointly by the Departments of Rural Economy and Sociology.) Students register in the Department of Rural Economy.

INT D 357. *Health Care Economics.* ★3 (either term, 3-0-0). Resource allocation in the health care industry; production and cost relationships within various types of institutional settings (hospital, medical firm); the role of the price mechanism in allocating resources. Manpower planning; the role of the government and professional groups in allocating resources in the non-price sector of the health industry. (Department of Economics and the Division of Health Services Administration.) Students register in the Division of Health Services Administration.

INT D 365. *Natural Resource Economics.* ★3 (either term, 3-0-0). Economics of natural resources related to agriculture and forestry; conservation, population, resource scarcity, property and tenure institutions, economic rent and resource pricing, resource development and evaluation, environmental protection, public resource policy. Prerequisite: ECON 201 or equivalent; ECON 202 recommended. (Note: Not open to students with credit in ECON 365.) (Offered jointly by the Departments of Forest Science and Rural Economy.) Students register in the Department of Rural Economy.

INT D 366. *Economics of Outdoor Recreation.* ★3 (either term, 3-0-0). Economic implications of outdoor recreation development and use with emphasis on location and time factors and consumer activities and expenditures. Benefit-cost evaluation of outdoor recreation resource use in the context of multiple land use, with public policy guidelines for privately and publicly owned recreation resources. Prerequisite: ECON 201 or equivalent; ECON 202 recommended. (Offered jointly by the Departments of Economics, Forest Science, Recreation Administration, and Rural Economy.) Students register in the Department of Rural Economy.

INT D 369. *Economics of the Environment.* ★3 (either term, 3-0-0). Economic growth and the deterioration of the environment; types and causes of environmental deterioration; theory, policy, and measurement relating to environmental deterioration; recreation economics; and current Canadian environmental topics. Prerequisite: ECON 201 or 304 or 307. (Departments of Economics and Rural Economy.) Students register in the Department of Economics.

INT D 382. *Theory and Practice of Cooperation.* ★3 (First Term, 3-0-0). Economic and sociological principles of cooperation; the evaluation of cooperative organization; cooperative law and taxation; management and finance of cooperatives. Students register in the Department of Rural Economy.

INT D 393. *Political Sociology.* ★3 (either term, 3-0-0). An examination of the impact of social organization and structure on the conduct of politics in mass societies, and of the ways the organization and structures of such societies are affected by political processes. Prerequisite: POL S 200 or 201 and 202; or SOC 202 or 403, or consent of the Department (either Political Science or Sociology). Students register in the Department of Political Science.

INT D 401. *Film Theory and Criticism.* ★3 (either term, 3-0-0). Investigation of the problems of understanding and evaluating film. Includes close analysis of film extracts in class. Prerequisite: INT D 300. Note: This course is accepted as a part of student's program only by the Department of Comparative Literature, the other Departments accept it only as an option. (Departments of Art and Design, Comparative Literature, Drama, English, Philosophy, Political Science, and Romance Languages.) Students register in the Department of Philosophy.

INT D 432. *Forest Administration and Policy.* ★3 (Second Term, 2-1s-0). Analysis of the political, institutional, and administrative factors which influence the development and implementation of forest and conservation policies in Canada, the United States, and other countries. Forest administration and organization: policy as a guideline for managerial decision-making. Prerequisite: FOR 430 or equivalent. Formerly INT D 330. (Offered jointly by the Departments of Forest Science and Rural Economy.) Students register in the Department of Forest Science.

INT D 443. *The Soviet North and Siberia.* ★3 (Second Term, 3-0-0). The economy, political administration, and the social development of the native peoples of Siberia and the Soviet North. Prerequisite or corequisite: An area-related course in one of geography, political science, economics, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies and Departments of Anthropology, Economics, and Geography.) Students register in the Division of East European Studies.

INT D 444. *The Ukraine.* ★3 (Second Term, 3-0-0). Major social, economic, political, and cultural trends in the Ukrainian SSR in the post-World War II period. Prerequisite or corequisite: An area-related course in one of geography, history, political science, or Ukrainian, or consent of the Division of East European Studies. (Participating units normally include Division of East European Studies and Departments of History and Slavic Languages.) Students register in the Division of East European Studies.

INT D 445. *Poland.* ★3 (First Term, 3-0-0). The political, social, economic, and cultural developments in post-World War II. Prerequisite: INT D 346, or POLSH 304 or equivalent, or demonstration to the Division of East European Studies of sufficient background in the area. (Participating units normally include Division of East European Studies and Departments of Economics, Fine Arts, Geography, Slavic Languages and Sociology.) Students register in the Division of East European Studies.

INT D 446. *Eastern Europe: A Travel-Study Course.* ★6 (5-0-15). An intensive interdisciplinary study of Eastern Europe and the Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Spring or Summer Session in countries of Eastern Europe and the USSR on a selected basis and includes intensive study in one or more countries. Prerequisite: INT D 346, or consent of the Division of East European Studies. Pre-session study and preparation. Students register in the Division of East European Studies.

INT D 455. *Migration.* ★3 (either term, 3-0-0). Internal and international migration, and its relationship to resources, economic opportunities, and societal organization in Canada and other countries; concepts, measures and analytical techniques; determinants and consequences of migration; types and models of migration; adjustment of migrants; migration and urban and metropolitan growth. (Departments of Geography and Sociology.) Students register in the Department of Sociology.

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). Social problems in Canadian rural life; analysis of policy-making processes related to these problems. Prerequisite: Consent of instructor; INT D 356 recommended. (Offered jointly by the Departments of Rural Economy and Sociology.) Students register in the Department of Rural Economy.

INT D 458. *Socio-economic Development of Western Canadian Agriculture.* ★3 (First Term, 3-0-0). The economic and social origins of western Canadian agricultural development. A chronological examination of farm and political organizations and other agrarian social movements influencing the farming sector. The growth of public policy and development of the institutional framework supporting agriculture. Discussion of past and present issues in western Canadian agricultural development, including such factors as land settlement, transportation, and farming support services. Prerequisite: R SOC 355 or SOC 202 or 403 or equivalent. (Offered jointly by the Departments of Rural Economy and Sociology.) Students register in the Department of Rural Economy.

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). The history, origins, foundation, and definitions of community development. (Division of Community Development and Department of Sociology.) Students register in the Department of Sociology.

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0). Economics of utilizing and conserving land, water, and energy resources in agriculture and forestry. Prerequisite: Consent of instructor; INT D 365 recommended. Students register in the Department of Rural Economy.

INT D 466. *Principles of Heritage Interpretation.* ★3 (either term, 3-0-0). Examination of heritage interpretation as an expression of cultural/environmental recreation programs. Prerequisite: Consent of instructor. (Offered jointly by the Departments of Forest Science and Recreation Administration.) Students register in the Department of Recreation Administration.

INT D 467. *Methods of Heritage Interpretation.* ★3 (Second Term, 3-0-0). Application of principles of interpretation of natural and historic resources. Focus on management techniques, development of facilities and of interpretive programs. Case studies and field trip. Prerequisite: Consent of instructor; INT D 466 recommended. (Offered jointly by the Departments of Forest Science and Recreation Administration.) Students register in the Department of Forest Science.

INT D 468. *Principles of International Humanitarian Law.* ★3 (either term, 3-0-0). Historical background; humanitarian intervention; human rights; law of war; international criminal law. Prerequisite: Consent of Faculty of Law or Department of Political Science. Note: Formerly IN ST 466. Students register in Department of Political Science.

INT D 470. *Field Trip in Heritage Interpretation.* ★3 (Spring Session, Second Term, 0-2-6). Extended field trip to examine comparatively the philosophies, approaches, and applied methodologies of a diverse range of institutions and agencies engaged in the practice of heritage interpretation. Prerequisite: INT D 466, and/or INT D 467, or consent of instructor. (Offered jointly by the Departments of Forest Science and Recreation Administration.) Students register in the Department of Forest Science.

INT D 475. *The Family in Socio-Historical Perspective.* ★3 (either term, 3-0-0). Comparative study of the family in socio-historical context with emphasis on North American and European family systems. Critical examination of contemporary sociological family theory in relation to historical data. Issues in socio-historical research methods of family study. Prerequisite: SOC 371 or equivalent. (Departments of History and Sociology.) Students register in the Department of Sociology. Not being offered in 1981-82.

INT D 478. *The Multinational Corporation and Public Policy.* ★3 (First Term, 3-0-0). The development and role of large corporations within North American and European captialism, with particular reference to the Canadian experience. A historical outline is followed by a selection of material on imperialism, international relations, international trade and commercial organization, designed to expose problems of public policy and shifts in social and economic power arising from the emergence of the multinational corporation. Prerequisite: Consent of the Department. (Departments of Economics and Political Science.) Students register in the Department of Economics.

INT D 479. *The Multinational Corporation and Public Policy Case Studies.* ★3 (Second Term, 3-0-0). Prerequisite: INT D 478. (Departments of Economics and Political Science.) Students register in the Department of Economics.

INT D 486. *Livestock and Meat Marketing.* ★3 (Second Term 3-0-1). Marketing problems, potentials, and principles studied through in-depth analysis of the red-meat industry. Quota Maximum registration 30. Prerequisite: Consent of instructor (Offered jointly by the Departments of Animal Science and Rural Economy.) Students register in the Department of Rural Economy.

INT D 500. *Nature of Man.* ★6 (0-3s-0). A seminar comparing the various conceptions of the nature of man held by sociologists psychologists, biologists, philosophers, theologians, writers and artists, and exploring some of the major social and philosophical issues which confront men today from the perspectives of these disciplines. (Departments of Philosophy and Psychology.) Students register in the Department of Philosophy.

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). A detailed description of enzymatic reactions in biosynthetic pathways of carbohydrate, amino acid, vitamin, and coenzym metabolism, emphasizing interrelationships among metabolic pathways, and stressing relationships between metabolic pathways and growth and function of microbial and animal cells. Prerequisite: BIOCH 300 or equivalent. Offered in alternate years. Students register in the Department of Microbiology.

INT D 506. *Community Development Field Methods and Techniques.* ★3 (either term, 3-0-0). Practical training in field methods and techniques related to the principles and practices of community development, for example: Strategies of Involvement and Participation, Small Group and Large Group Skills, Program Planning, Community Analysis, The Use of Communications and Mass Media. Prerequisite: Consent of Division of Community Development. Students register in the Division of Community Development.

INT D 509. *Conference Course in Community Development.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Division of Community Development. Students register in the Division of Community Development.

INT D 510. *Community Development Practicum.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Division of Community Development. Students register in the Division of Community Development.

INT D 516. *Learning in the Community.* ★3 (either term, 3-0-0). An examination of how and what people learn in a community through mass media, institutions and organizations, traditions and customs, popular culture, advertising, etc. The value of information and knowledge in the development of a community will be explored and assessed. Prerequisite: Consent of the Division of Community Development. Students register in the Division of Community Development.

INT D 540. *Seminar on Comparative, Legal, Constitutional, and Federal Studies.* ★6 (0-3s-0). Prerequisite: Consent of the Department. (Departments of History and Political Science.) Students register in the Department of Political Science.

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar. (Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, and Sociology.) Students register in the Division of East European Studies.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and methods of investigation in these fields. Offered alternate years. Prerequisites: BIOCH 300 or 372, or PL SC 431 and 432, or equivalent. (Offered jointly by the Departments of Botany and Plant Science.) Students register in the Department of Plant Science.

INT D 559. *Theories of Community Development.* ★3 (either term, 3-0-0). A study of the major theories of community development, with respect to their philosophy and their methodology and the relative merits of various approaches to community development. Prerequisite: INT D 459 or equivalent. Students register in the Division of Community Development.

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). An examination of current environmental research in the Canadian North. Seminars are presented by professionals engaged in various facets of northern research. Prerequisite: Consent of the instructor. (Offered by the Boreal Institute for Northern Studies and the Department of Geography.) Students register in the Department of Geography.

INT D 566. *Resource Economics II: Economics of the Environment.* ★3 (either term, 3-0-0). Economic theory and policy relating to resource and environmental quality problems; welfare and public policy issues in resource decision-making; the relationships between economic growth and environmental preservation; externalities and public goods; economics of pollution; recreation economics; selected Canadian environmental issues. Students register in the Department of Economics.

INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0). An examination of the contributions of philosophy and psychology to the behavioral sciences. (Departments of Philosophy and Psychology.) Students register in the Department of Psychology.

INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0). An examination of the contributions of philosophy and psychology to the behavioral sciences. (Departments of Philosophy and Psychology.) Students register in the Department of Psychology.

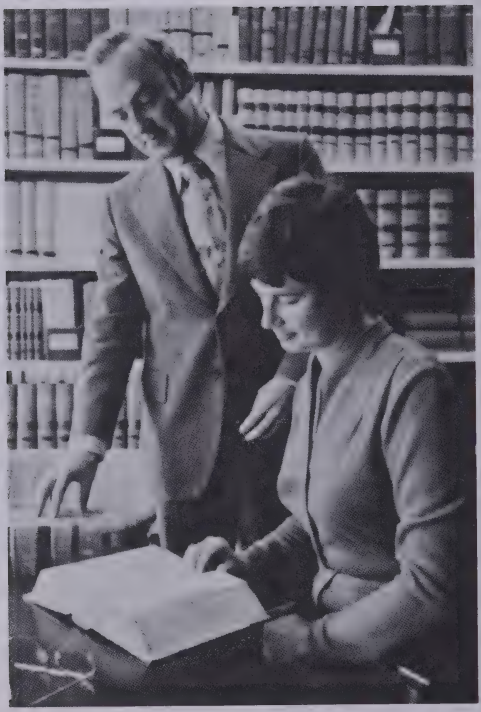
INT D 601. *Comparative Community Development.* ★3 (First Term, 3-0-0). A detailed study of the application of community development theories in specific projects; a survey and evaluation of representative programs in community development in Canada and elsewhere. Prerequisite: INT D 459 or equivalent. Students register in the Division of Community Development.

INT D 602. *Current Issues in Community Development.* ★3 (Second Term, 3-0-0). An examination of current social problems and their relevance to community development theory and practice; the relevance of community development approaches to contemporary community development problems. Prerequisite: INT D 459 or equivalent. Students register in the Division of Community Development.

INT D 623. *Clinical Research Seminar on Aphasia.* ★3 (either term, 3-0-3). Students register in the Department of Linguistics.

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). (Departments of Geography and Sociology.) Students register in the Department of Geography.

INT D 900. *Non-Thesis Project.* ★3 (either term, variable). Note: For Community Development students enrolled in the non-thesis M.A. Program. Prerequisite: Consent of the Division of Community Development. Students register in the Division of Community Development.



Faculty of Law

101 INTRODUCTORY

101.1 Members of the Faculty

101.1.1 STAFF

Professor and Dean

F. D. JONES, Q.C., B.A. (Alberta), LL.B. (Dalhousie), LL.M. (Toronto)

Associate Dean

E. I. PICARD, B.Ed., LL.B., LL.M. (Alberta)

Honorary Professor

The Honourable R. MARTLAND, B.A., LL.B. (Alberta), B.C.L. (Oxon), LL.D. (Alberta)

Emeriti

W. F. BOWKER, Q.C., B.A., LL.B. (Alberta) LL.M. (Minnesota), LL.D. (Alberta)

A. SMITH, Q.C., B.A., LL.B. (Alberta), LL.M. J. S. D. (Stanford), LL.D. (Queen's), LL.D. (Alberta)

Professors

B. M. BARKER, LL.B. (Saskatchewan),Dip.Crim. (Cantab)

D. C. DAVIES , LL.B. (Wales), LL.M. (Pennsylvania)

C. R. B. DUNLOP, B.A., LL.B. (Alberta), LL.M. (London), M.A. (Alberta)

W. H. HURLBURT, Q.C., B.A., LL.B. (Alberta)

F. D. JONES, Q.C., B.A. (Alberta), LL.B. (Dalhousie), LL.M. (Toronto)

S. P. KHETARPAL, B.Sc. (Punjab), B.L. (Rangoon), LL.M., Ph.D. (London)

F. A. LAUX, B.A., LL.B. (Alberta), LL.M. (Harvard)

T. W. MAPP, B.A. (Rochester), J.D. (Illinois)

W. K. J. MIS, B.A., LL.B. (Alberta), LL.M. (London)

D. R. PERCY, M.A. (Oxford), LL.M. (Virginia)

E. I. PICARD, B.Ed., LL.B., LL.M. (Alberta)

L. J. POLLOCK, Q.C., B.A., LL.B. (Saskatchewan)

W. J. SYCHUK, Q.C., B.A., LL.B. (Saskatchewan), M.C.L. (Southern Methodist)

J. S. WILLIAMS, LL.B. (Sheffield), B.C.L. (Oxford), LL.M. (Sheffield)

Associate Professors

B. P. ELMAN, B.Sc. (McGill), LL.B. (Dalhousie), L.L.M. (Harvard)

G. L. GALL, B.A. (Queen's), LL.B. (Windsor)

R. G. HOPP, B.Ed., LL.B. (Alberta)

D. P. JONES, B.A. (Hons.) (McGill), B.A. (Hons.) (Juris), B.C.L., M.A. (Oxford)

L. N. KLAR, B.A., B.C.L., LL.M. (McGill)

M. M. LITMAN, LL.B. (Osgoode)

P. J. M. LOWN, LL.B. (Hons.) (Glasgow), LL.M. (Saskatchewan)

A. A. McLELLAN, B.A., LL.B. (Dalhousie), LL.M. (London)

R. S. NOZICK, B.A., LL.B. (Manitoba), LL.M. (Harvard)

A. C. RICE, LL.B. (Dalhousie), LL.M. (New York)

M. F. RUTTER, M.A., B.C.L. (Oxon), LL.M. (Harvard)

Assistant Professors

T. J. CHRISTIAN, B.A. (Alberta), LL.B. (Cambridge)

E. R. MEEHAN, LL.B. (Edinburgh), LL.M. (McGill), LL.B. (Ottawa)

E. P. MENDES, LL.B. (Exeter), LL.M. (Illinois)

Visiting Professor

J. SMITH, B.A., B.C.L. (Oxon)

Inter Faculty Professor

L. C. GREEN, LL.B., LL.D. (Hons.) (London)

Special Lecturers

The Honourable J.B. DEA, B.A., LL.B. (Alberta)

The Honourable J.B. FEEHAN, B.A., LL.B. (Saskatchewan)

His Honour Judge L. L. JONES, B.A., LL.B. (Alberta)

The Honourable S. S. LIEBERMAN, B.A., LL.B. (Alberta)

The Honourable J. W. McCLUNG, B.A., LL.B. (Alberta)

The Honourable T. H. MILLER, B.A., LL.B. (Alberta)

The Honourable A. F. MOIR, B.A., LL.B. (Alberta), LL.M.(Harvard)

The Honourable W. A. STEVENSON, B.A., LL.B. (Alberta)

The Honourable A.H. WACHOWICH, B.A., LL.B. (Alberta)

Sessional Lecturers

D. C. ABBOTT, Q.C., B.A., LL.B. (Manitoba)

B. W. AITKEN, B.Mus. (Calgary), LL.B. (Alberta)

S. A. BERCOV, B.Com., LL.B. (Alberta)

R. L. BERGER, Q.C., B.A., LL.B. (McGill)

B. A. CHIVERS, B.A., LL.B. (Alberta)

P. T. COSTIGAN, B.Ed., LL.B. (Alberta)

J. L. DEWAR, LL.B. (Tasmania), LL.M. (Alberta)

P. J. FAULDS, LL.B. (Alberta)

C. R. HEAD, B.A., LL.B. (Alberta)

C. A. KENT, B.A. (Calgary), LL.B. (Alberta)

J. M. LAW, B.A., LL.B. (Alberta)

A. H. LEFEVER, B.Ed., LL.B. (Alberta)

R. J. LYONS, B.A., LL.B. (Alberta)

R. C. MAYBANK, B.Sc., LL.B. (Alberta)

D. B. McLEAN, B.Sc., LL.B. (Alberta), LL.B. (Melbourne)

R. A. McLENNAN, Q.C., B.A., LL.B. (Alberta)

I. RAMSAY, LL.B. (Edinburgh), LL.M. (McGill)

J. E. REDMOND, Q.C., B.A., LL.B. (Alberta), B.C.L. (Oxford)

J. C. ROBB, B.A. (Calgary), LL.B. (Alberta)

A. H. RUSSELL, B.A., LL.B. (Alberta)

H. I. SHANDLING, B.A., LL.B. (University of Cape Town, South Africa)

A. C. L. SIMS, B.A., LL.B. (Alberta)

P. A. SMITH, B. A. (Toronto), LL.B. (Alberta), LL.M. (Harvard)

J. STERK, B.A., LL.B. (Alberta)

M. P. STONE, B.A. (Saskatchewan), M.A., Ph.D. (Wisconsin), LL.B. (Saskatchewan)

G. A. VERVILLE, B.Sc., LL.B. (Manitoba)

B. VOGEL, B.A., LL.B. (Alberta)

R. B. WHITE, B.Com., LL.B. (Alberta)

Law Librarian

L. MACPHERSON, B.A. (Saskatchewan), M. Libr. (Washington)

Administrative Officer
R. H. GRAHAM

Admissions Officer and Student Advisor
A. A. DRYDEN, A.A. (Yuba)

101.1.2. ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, B.A. (Sir George Williams), M.Ed. (Alberta), Ed.D. (Stanford)

Director, Institute of Law Research and Reform
W. H. HURLBURT, Q.C., B.A., LL.B. (Alberta)

Representative of Law Society
J. V. DECORE, Q.C., B.A., LL.B. (Alberta)

Registrar of the University
W. A. BLANCHARD, B.A. (San Francisco State College), M.A., Ph.D. (Oregon)

101.2 History

From the time the Lieutenant-Governor of the North-West Territories in Council enacted the first Legal Profession Ordinance in 1885, a person wanting to practice law in the Territories could do so by serving articles with a practitioner, and passing prescribed examinations. After Alberta became a province, the Legal Profession Act of 1907 provided a period of five years' articles for a candidate without a degree, and three years for one with a degree in arts, law, medicine, science or literature.

When the university began classes in 1908 there was no Faculty of Law. However the president, Dr. Tory, believed in a close link between the University and the professions. At his instigation the University Act of 1910 gave the Senate power to make arrangements with the Law Society for conducting its examinations and appointing examiners. A formal agreement was accordingly made, effective January 1st, 1913. With the cooperation of the Benchers of the Law Society, Dr. Tory himself selected the lecturers. There were eight or nine in Edmonton and a like number in Calgary. In each city lectures were given in the Court House in the early morning or late afternoon. These lectures led to admission to practice, not to the degree of LL.B. However, the University as early as 1914 did grant that degree. The course required four years, but not in full time attendance. Most who enrolled for the degree were articled students. They obtained the degree by taking the prescribed lectures and examinations in addition to those required of articled students.

By 1920 there was strong support both within the profession and the University for the establishment on the campus of a Faculty that would provide a three year course for students in actual attendance and that would have full-time teachers. The Faculty came into being in 1921, and at the same time an amendment to the Legal Profession Act provided that a candidate with the new LL.B. could be admitted to practice after one year's articles. Senior matriculation was required for admission and there was also provision for a combined course in Arts and Law, which took six years from junior matriculation. The combined course was abolished only in 1974. In the meantime, the old type of articling fell into disuse after the Faculty was established, though it was not formally abolished until 1954.

When the Faculty was founded, Dr. Tory, President of the University, was thorough in his search for a full-time teacher who, it was hoped, would ultimately become Dean. He was fortunate in obtaining the services of John A. Weir, a Rhodes Scholar from Saskatchewan. Weir became Dean in 1926 and so remained until his untimely death in 1942. He was a great teacher. In 1930, Malcolm MacIntyre joined the Faculty. Having studied under Roscoe Pound at Harvard, he had a sociological approach to law. He and Dean Weir made an excellent team. Their influence on the Bar and Bench remains. When Weir died in 1942, MacIntyre became Dean. However, he resigned in 1945 at a time when the student body had shrunk to a handful. George H. Steer, a leading Edmonton practitioner who had played a major part in establishing the Faculty and in teaching important subjects, was Acting Dean for the period 1944-47. In the fall of 1945 he arranged with the University to have a member of his firm, W. F. Bowker, teach full time for a year. The arrangement became permanent and in 1948 Bowker became Dean — a position he held until 1968 when he became Director of the newly-established Institute of Law Research and Reform. Subsequent Deans have been Gerald Laforest, G. H. L. Fridman and the incumbent, Frank Jones.

In 1947 Alexander Smith joined the Faculty and remained until his retirement in 1973. His contribution to legal education both as a teacher and authority in Constitutional Law is immeasurable.

The student enrolment was small in the early years. The annual number of graduates never exceeded twenty-five until after World War II. In 1951 there were over fifty, most of them veterans. The number then declined until 1967 when it began to rise quickly so that there are now one hundred and fifty a year. The entering class has been limited to one hundred and eighty.

Having been in existence for over half a century, the Faculty has produced 10 Rhodes Scholars, most of today's Alberta judges and many persons in public life. Most of its graduates have stayed in the province. Indeed for many years after World War II they did not fill the demand for articling students. At the present time the large graduating classes are the main source of lawyers in the province.

The size of the full-time teaching staff gradually increased after World War II so that there were nine in 1967-68. Then the quick rise in student enrolment brought with it an expansion of the teaching staff so there are now 25 full-time members.

The Faculty has always received great support from members of the profession in Edmonton who have acted as part time sessional instructors. In the early years, prominent names were George H. Steer, S. W. Field, L. Y. Cairns, H. A. Dyde, and A. B. Harvey. At the end of World War II the Faculty was entirely dependent on sessional instructors. At the present time there are 38 practitioners lecturing in one or more subjects.

The Faculty's quarters were originally Room 206 in the Arts Building which served as the Law Library. When the Rutherford Library was completed in 1952, a reading room was provided for law which was by then beginning to acquire a respectable collection which now amounts to 100,000 volumes. Faculty offices were moved to the Rutherford Library in 1964, where they remained until 1971 when the new Law Centre was opened. In the Centre the classrooms, library, moot court room and common rooms provide the best of facilities.

The original curriculum was based on one recommended by the Canadian Bar Association. It remained unchanged until after Dean Weir's death when Dr. MacIntyre introduced several new subjects especially in public law. In recent years many more courses have been added, including seminars and options. Where enrolment in a given subject is large the

class is divided into sections of not more than sixty students.

One notable development has been in Oil and Gas Law which was added to the curriculum some 20 years ago. Our graduate program, leading to the degree of LL.M., and which has been in existence since 1965, has stressed this subject.

Other activities have contributed to the role of the Faculty. The moot court program has always played an important part. To encourage legal writing Dr. MacIntyre established the Alberta Law Quarterly in 1934. Though publication was suspended near the end of World War II, it was revived in 1955 in the form of the Alberta Law Review which has become an important legal journal. Student Legal Services have given students an opportunity to serve in a practical way; and the close association of the Faculty with the Institute of Law Research and Reform has given to the teaching staff some contact with law reform.

The objective of the Faculty has been to encourage rigorous analysis and to develop the critical faculty. The "case system" is still basic. However more emphasis is now put on statute law and legal writing. Research is encouraged with a view to teaching the students to form and write defensible opinions. There is an effort to introduce students into such practical subjects as advocacy. At the same time the aim is to make them appreciate law as a scholarly discipline and as a means of social control to the end that they will contribute to the better administration of justice.

DR. W. F. BOWKER
January, 1977

Dean Bowker in his note on the history of the Faculty of Law is characteristically brief, discriminating in choice of themes, and just in his recognition of the contributions of others. Equally characteristic is his omission of all direct reference to his own achievements in the two decades he served as Dean. Perhaps an ex-colleague may offer a needed addendum.

One might speak of his prodigious and successful efforts to cope with the post-war enrolments of returned veterans, the growth of the library, his unobtrusive fostering of the *Law Review*, his original and distinctive course in legal writing, and much else. However, in this short and unauthorized postscript, perhaps the matters to mention are those deriving from the qualities of the man himself: the breadth of his scholarly and other interests, remarkable in one who was never a dilettante and is always thorough and well-informed in treating any subject; the merit of his teaching, in which the law was presented in its social and philosophic context, with a clarity never purchased at the cost of accuracy; his service to law reform, through criticisms that were perceptive and responsible and proposals that were sound as well as progressive; and the imprint on all his students and colleagues of his example of personal integrity and professional standards. Above all, there is the rich humanity that has made him the entertaining lecturer, trusted confidante and delightful companion so affectionately regarded by his students and all his other, innumerable, friends.

PROF. D. T. ANDERSON
January, 1977

101.3 General Information

1. *The Program.* The Faculty of Law of The University of Alberta offers a program of required and optional courses in law which is designed to (a) provide students with a general legal education in the fundamental principles of law, the structure and content of the legal systems of Alberta and Canada, and the history and philosophy of law; (b) qualify students for the practice of law in Alberta or any other common law jurisdiction in Canada; (c) train students in the legal aspects of business and government administration. The program requires full-time attendance for three academic years, and leads to the degree of Bachelor of Laws (LL.B.).

The nature of legal studies, and the scope and content of the courses offered in the Faculty are such that students should possess an adequate knowledge and understanding of at least some of the following: history, economics, philosophy, and political science. The ability to reason orally and in writing, an adequate command of the English language, and an interest in society, its organization and its sociological manifestations are also highly relevant to successful legal studies. A pre-law scientific background is not in itself a disadvantage, and may in some instances be an extremely suitable basis for undertaking the study of the law; however, in general, literary, historical, economic, philosophic, and similar studies provide the most satisfactory foundations for legal training.

2. *Professional Requirements.* Graduates of the Faculty who wish to enter upon the practice of law must meet the requirements of the jurisdiction in which they desire to practice. In addition to other requirements such as a period of pre-law training, whether or not culminating in a degree, and a period of articles, a University degree in law is a basic prerequisite for admission to practice throughout Canada. The Alberta LL.B. degree will normally be accepted in other Canadian common law jurisdictions for the purpose of satisfying the relevant requirement as to a degree in law.

In the Province of Alberta a resident graduate in law who wishes to be admitted to the Bar must article with a practising member of the Bar and serve under him/her for a period of one year. It will also be necessary for such a graduate to take the Bar Admission Course provided by the Law Society of Alberta and to pass a special Bar examination which consists of a paper or papers in general subjects related to law. To be admitted as a student-at-law serving articles with a member of the Alberta Bar, it is necessary to fulfill the provisions of the Legal Profession Act, which requires a degree and an LL.B., or two years of studies which would lead to a Bachelor of Arts degree at a University in Alberta and an LL.B. degree. Reference should be made to that Act for further details.

The number of students entering the practice of law in Alberta has increased in the last few years and a degree in law is no guarantee of a position in either the necessary year of articles (described above) or in the practice of law.

3. *The Post Graduate Diploma Program in Law.* The Faculty of Law offers a program of studies leading to a Postgraduate Diploma in Law. This program may be of interest to members of Canadian Law Societies and other legally qualified persons.

The program was designed to provide an extensive exposure to a limited area of the law with a view to bringing practitioners and other members of the legal profession up-to-date or helping prepare candidates as specialists in that area.

Holders of an LL.B. degree, or its equivalent from the University of Alberta, who also meet the requirements for admission to the Faculty of Graduate Studies and Research in other respects and who have had a mini-

mum of two years experience in the practice of law or a related field may be admitted to this program of study. Inquiries should be directed to the Chairman of the Postgraduate Diploma Committee of the Faculty of Law.

4. *The Bachelor of Laws Master of Business Administration Combined Degree* (LL.B./M.B.A.). The Faculty of Law and the Faculty of Business Administration and Commerce with the co-operation of the Faculty of Graduate Studies and Research offer a combined LL.B./M.B.A. degree. The course of study allows graduates to earn both a Bachelor of Laws (LL.B.) and a Master of Business Administration (M.B.A.) degree in four calendar years instead of the five academic year period normally required to complete both degrees.

The program is designed to afford students an opportunity to obtain a professional education in both Law and Business Administration as preparation for a career in which law and management overlap.

5. *Master of Laws (LL.M.).* The Faculty also offers a program of studies leading to the degree of Master of Laws (LL.M.). This involves attendance at a number of courses to be determined by the Dean of the Faculty and the submission of a dissertation on a subject to be chosen by the student in consultation with the Dean. Holders of an LL.B. degree, or its equivalent, from the University of Alberta, who also meet the requirements for admission to the Faculty of Graduate Studies and Research in other respects may be admitted to this program of study. The regulations for this program and the general regulations for graduate studies are set out in the Graduate Studies and Research Calendar (§ § 201-204). Inquiries should be directed to the Chairman of the Graduate Studies Committee of the Faculty of Law.

6. *The Law Library* has a collection of approximately 100,000 volumes. Included in this collection are — all major Canadian, English, Commonwealth and U.S. law reports; and Canadian, major British and Commonwealth, and U.S. statutes. In addition some 1,600 serial publications are currently received annually to provide a wide coverage of current legal writing.

7. *The Law Centre.* The Faculty is housed in the Law Centre on the campus of The University of Alberta. It opened for occupation and use for the first time in the fall of 1971. This building contains the Law Library, the Faculty offices, and classrooms. It also provides accommodations for the Institute of Law Research and Reform (a body organized by The University of Alberta in conjunction and collaboration with the Law Society of Alberta and the Attorney-General of the Province), the International Ombudsman Institute (funded by the Alberta Law Foundation), the Canadian Institute for the Administration of Justice, the Alberta Law Review, Cannons of Construction (a student run newpaper), the administrative offices of Student Legal Services and the Law Club. As its name would suggest, it is designed to afford a centre for legal studies and research in the Province of Alberta for undergraduates, graduates, practitioners, judges, legislators, and law reform bodies.

8. *The Alberta Law Review.* Students in the Faculty have the opportunity and are encouraged to prepare and submit articles for inclusion in the Alberta Law Review. This is published several times annually under the auspices and control of an editorial board of students advised by members of the Faculty. It circulates widely among members of the profession and judges in Alberta, as well as among lawyers and universities in other parts of Canada and abroad.

9. *Prospective law students* are invited to consult the Admissions Secretary of the Faculty for advice as to admission. Inquiries on the selection of options, or any other academic problems may be directed to the Student Advisor. Inquiries may also be directed to the Associate Dean of Law. See § 102.1 for further details.

102 ADMISSIONS

102.1 General Admission Requirements

(a) The Faculty Committee on Admissions ("the Committee") will consider the candidates for admission to the Faculty of Law in the following categories:

(i) Resident Applicants;
(ii) Non-Resident Applicants;
(iii) Special Applicants.

It is the sole prerogative of the Committee to determine the category of the applicant. Accordingly, prospective applicants should carefully read the description set out below.

(b) In measuring academic potential the Admissions Committee shall rely primarily on the grade point average (the "GPA") of the last 60 credit hours leading towards an undergraduate degree and the performance on the Law School Admission Test (the "LSAT"). The GPA shall be given twice the weight of the LSAT.

(c) In assessing the academic record of the candidate more weight will generally be given to marks received during a complete and regular academic session than to a broken academic pattern.

(d) The Committee will not consider any year of study or course or courses which cannot be credited toward a degree, or toward a university diploma approved by the Committee.

(e) The Committee will consider only those courses completed prior to or in the Winter Session preceeding the September in which admission is being sought.

(f) *Admissibility will be decided on a competitive basis having regard to all factors available to the Committee. There can be no guarantee of admission.*

(g) *Law School Admission Test (LSAT)*

(i) The LSAT is compulsory for all applicants. Test scores will be used to supplement a candidate's pre-law academic record. No special preparation for the test is necessary since it is designed to test aptitude rather than knowledge of subject matter. Test centres have been established at The University of Alberta in Edmonton and at The University of Calgary as well as at most other Canadian university campuses. It is recommended that candidates take the test in the winter of the year immediately preceding the year in which they are seeking admission. An LSAT application blank and bulletin of information, containing complete information concerning the administration of the test, as well as some sample questions can be obtained by writing to the Faculty of Law to Law School Admission Test, Educational

Testing Service, Box 2000, Newton, Pennsylvania, 18940; or to, The Examinations and Timetabling Division, Office of the Registrar, University of Alberta, Edmonton, Alberta, T6G 2M7.

(ii) The Committee reserves the right to average scores in the event that the applicant has taken the LSAT on more than one occasion. Accordingly, candidates are cautioned not to sit the LSAT if they are ill.

(iii) At least one LSAT must have been written within the last five years prior to admission

(h) *English Language Proficiency*

English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by the University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by the University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

(i) *The decision of the Committee in any matter is final and there is no appeal from the Committee to any other body or person within the Faculty or the University.*

102.2 Resident Requirements

A resident is one who normally has resided in Alberta, the North West Territories or the Yukon for one year immediately preceding the 1st day of September in the year admission is sought. Any period during which the applicant was registered as a full-time student in a post-secondary institution shall be excluded either as a period of residence or as a break in continuity. An Albertan studying elsewhere may be considered a resident.

(a) To be considered for admission to the LL.B. program a candidate must normally have completed a degree recognized by The University of Alberta. (For this purpose successful completion of three years of a four year Bachelor of Arts program at a recognized Alberta university is acceptable.)

(b) In special circumstances the Committee will consider applications from Alberta residents without a degree who have completed not less than two years, or equivalent, of a full program of studies that would be accepted for credit towards a B.A. degree at a university in Alberta. To be considered for admission in this manner, a candidate must produce evidence of outstanding academic ability, i.e.:

(i) A minimum grade point average of 7.5 or its equivalent over the two years of study.

(ii) A minimum LSAT score of 600.

(iii) Subjects of a rigorous nature which afford a student an opportunity to develop his or her powers of analysis and his or her ability in written and oral communication. In determining whether a candidate is of outstanding academic ability for this purpose, regard will be paid by the Committee to the quality of the courses taken by the candidate as well as to his or her performance therein.

(iv) *Admission of any candidate is not guaranteed merely because the above requirements may be fulfilled.*

(c) The Committee shall consider and evaluate, in its sole discretion, the content and grades of the candidate's academic performance and may reject candidates whose general performance or course of study the Committee does not consider satisfactory.

Special interpretations may be made by the Committee where individual circumstances warrant.

102.3 Non-Resident Requirements

(a) A non-resident must possess an undergraduate degree recognized by The University of Alberta or the equivalent of a degree (i.e., candidates electing to pursue a four-year program may be entitled to a degree from their university after three years).

(b) The Faculty has a quota set by The University of Alberta being 10% of admissions for non-resident Canadians plus 5% for non-resident students regardless of origin, residence or citizenship.

(c) The Committee will not necessarily accept non-resident candidates whose performance is equal or below that of resident Albertans.

(d) Grades of all applicants from universities other than The University of Alberta will be converted, insofar as possible, to the 9 point scale in use at The University of Alberta, for the purpose of competitive evaluation.

(e) § 102.2(a) applies to all non-resident applicants (candidates require a completed degree recognized by The University of Alberta).

102.4 Special Categories

No applicant can elect to be placed in any category. Allocation to such category shall be the responsibility of the Committee.

(a) *Native Applicants*

(i) Special consideration will be given by the Committee to native applicants who have a minimum of two years leading towards a Bachelor of Arts degree or equivalent acceptable to a university in Alberta.

(ii) The Committee recommends the Program of Legal Studies for Native Students offered at The University of Saskatchewan.

(iii) The requirements as set out in § 102.2(a) or (b) i, ii and iii are not applicable to native applicants. (Applicants who fit into this category do not need a completed degree and those applicants in this category who are not Alberta residents will only be required to have two years or equivalent as described in the regulation. The minimum grade point average and LSAT scores are not applicable.)

A native applicant is one who:

a. has Indian status under The Indian Act (Canada), or

b. has Indian status under The B.N.A. Act, or

c. is of native ancestry in the opinion of the Committee but who does not have status as above.

(b) *Mature Students*

A mature student is one who is at least 30 years of age prior to the first day of September in the year admission is sought.

A mature student shall:

(i) have successfully completed at least two years of undergraduate work that would be accepted by the Faculty of Arts, at a university in Alberta, towards a Bachelor of Arts degree, or have obtained an undergraduate degree from a university recognized by The University of Alberta;

(ii) exhibit evidence of past achievements in non-academic areas indicative of comparable ability to compete in the studies in law school;

(iii) in the opinion of the Admissions Committee, have an above average chance of success in law school.

The requirements set out in § 102.2(b) i to iii and § 102.3(a) and (c) may be waived in the discretion of the Committee. (Non-resident mature students may not be required to have a completed degree but will be required to have the two years or equivalent towards a B.A. degree. The minimum grade point average and minimum LSAT scores are not required, however, the LSAT must be written. The candidate's course of study will not be given as great weight as their particular background and personal development.)

(c) *Exceptional Cases*

The Committee has the sole discretion to admit candidates who might not otherwise qualify.

The decisions of past Committees cannot and do not bind the present or any other Committee.

102.5 Application Procedure

Application for admission to the LL.B. program must be made on or before the 28th day of February of the year in which the applicant is seeking admission. The "Faculty of Law Application Form" may be obtained from the Office of the Registrar or from the Faculty of Law and must be completed and forwarded with the required supporting documents to the Office of the Registrar.

All applicants will be notified by letter in July regarding admission or non-admission. Successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within the specified time of notification of acceptance. The deposit will be credited toward payment of tuition upon registration in September.

A small percentage of candidates may be admitted prior to July, if in the sole opinion of the Committee, they have shown outstanding performance in the work they have already undertaken. Such early admission may be made under such conditions as the Committee may stipulate. The Admissions Office will not accept telephone calls or correspondence in relation to eligibility for early admission. The Committee is not required to consider any applicant for early admission.

103 PROGRAMS OF STUDY

103.1 The Degree of LL.B.

(1) *Grading.* A final examination comprising 100 per cent of the grade will be held in each course in any year. However, exceptions to this rule may be made subject to the approval of the Dean. In cases in which an exception is made, a percentage of a grade in any course may be assigned by the instructor to examinations, performance in class, term papers, and other assignments. Early in the session, the instructor will announce to the class the basis on which grades are to be assigned.

(2) *Absence.* If a student has an unexcused absence from a term examination or an unexcused failure to submit a term paper or has failed to perform any other required assignment, the grade assigned to him/her for the term examination, term paper, or other required assignment shall be zero. However, in case of illness or other extreme circumstance, the student may be excused from writing the term examination or submitting the term paper or performing the required assignment. To be excused a student must present to his/her instructor an absence slip signed by the University Health Service, where illness is the cause, or by the Registrar, where the cause is other than illness. Where the excuse is accepted, the percentage weight allotted to the term examination, term paper, or required assignment will be added to the percentage weight allotted to the final examination. For regulations governing absence from a final examination see § 16.3.2 of the University Regulations and Information for Students' Calendar.

(3) *Marking.* Marking in the Faculty of Law is on a point scale. The word description of the nine grades is as follows:

9—outstanding	4—conditional pass
8—excellent	3—fail
7—very good	2—fail
6—good	1—fail
5—pass	

(4) *Promotion.*

(a) *Credit Hours.* To be eligible for the LL.B. Degree a student must have been in full-time attendance at the Faculty for three academic years. In each year of the three years, law students are required to take a pr

gram of required and optional courses totalling not less than 29 credit hours nor more than 31 credit hours (see § 104 below for required courses, optional courses and credit hours) and to accumulate a total of not less than 90 credit hours over the three academic years to qualify for the degree of Bachelor of Laws. The Dean or the Dean's delegate may permit a student to register for more than the prescribed maximum credits in an academic year. In extraordinary circumstances, the Dean or the Dean's delegate may permit a student not in first year to register for fewer than 29 credit hours. A student will not be permitted to spend in excess of a total of four years in the Faculty, save in exceptional circumstances. Students are required to pass each course attempted with a minimum grade of 4 before receiving credit for the course.

(b) (i) *Demerit System.* The Faculty operates under a demerit system. Under this system three demerit points are allotted for each conditional pass grade of 4 and four demerit points are allotted for each of the failing grades, of 3, 2, and 1 received by a student. The demerit points in each course are multiplied by the course weight (course weights are set out in § 104 below), the resulting figure being the course "demerits". The course demerits are totalled to arrive at the student's "demerits". Any student accumulating a total of 45 demerits or more in one academic year shall be required to withdraw from the Faculty of Law. Any student with an accumulation of less than 45 demerits shall receive credit for each course in which a passing or conditional pass grade was obtained and shall receive no credit in a course or courses in which a failing grade was obtained. Any compulsory course failed shall be repeated and any non-compulsory course failed may be repeated. A student who has completed three academic years of the Law Program as provided in subparagraph 4(a) but has failed to acquire the requisite 90 credit hours due to failures may enter into a fourth year during which he/she must take and pass sufficient courses to acquire the said 90 credit hours. A student will not be permitted to spend in excess of a total of 4 years in the Faculty, save in exceptional circumstances.

(ii) For students who entered the Faculty in the 1980/81 academic year, and subsequently the demerit system shall be abolished and a minimum grade point average of five (5) shall be restored as the minimum grade required for promotion for all years. A student obtaining less than a grade point average of 5 will be required to withdraw.

(5) *Supplementals.* No supplementals shall be granted to a student accumulating 45 demerits or more in an academic year. In a course where there is no final examination no supplemental examination can be granted. Subject to the aforesaid, a student who fails a course or courses but has accumulated less than 45 demerits in any one year shall be entitled to one supplemental examination in that year as of right. Supplemental examinations may be granted only in courses in which the weight assigned to a final examination under paragraph (1) hereof is 40% or higher and will be graded on a pass/fail basis.

For those students who entered the Faculty in the 1980-81 academic year, and subsequently, no supplementals shall be granted to a student obtaining less than a grade point average of five (5.0) in an academic year. In a course where there is no final examination no supplemental examination can be granted. Subject to the aforesaid, a student who fails a course or courses but has a grade point average of five (5.0) or better in any one year shall be entitled to one supplemental examination in that year as of right.

(6) *Appeals.* A student adversely affected by the regulations or their application shall have a right to appeal in accordance with the Faculty's Academic Appeals Procedure with a further right of appeal to the Academic Appeals Committee of General Faculties Council (See § 16.7 (Appeals and Grievances) of the University Regulations and Information for Students Calendar).

(7) *Viva voce examination.* All students seeking the degree of LL.B. may be required by the Faculty to pass a viva voce examination at the end of their last year. Such an examination would be of general character covering the work of the three years of the Law program.

103.2 Moot Courts

The Moot Court program is designed to give students experience both in preparation of the case for argument and in the presentation of such argument before an Appellate Court.

The students in first year are required to argue a moot case in their Second Term and to achieve a satisfactory standing in their presentation. They are judged by third year students, lawyers and Faculty members.

In the second year, students participate in a voluntary mooting program, the Edmonton Bar Moot Court Competition. These moots begin in the early fall and conclude in the spring with runoffs to select the best mooters of the year. Judges for this program are drawn from the Bench, the Profession and the Faculty.

The highlight of the mooting program is the Honourable Clinton J. Ford Moot Court Competition. Four of the students participating in the voluntary mooting program are selected to compete for the Honourable Clinton J. Ford Shield, a gift of the late Chief Justice and the highest award for mooting in the Faculty of Law at The University of Alberta. The competition is held in the late fall of the four finalists' final year of Law, with the competitors arguing in two teams, the winning team receiving the Shield. The competition is judged by a panel of three, representing the Bench, the Senior Bar and the Junior Bar.

103.3 Graduate Studies

103.3.1 THE POSTGRADUATE DIPLOMA IN LAW

(1) The Faculty of Law offers a program of graduate study leading to a Postgraduate Diploma in a specialized area of Law.

(2) Applicants for this program must hold the degree of LL.B. or its equivalent from this or some other university. They must have had a minimum of two years experience in the practice of law or in a related field. They must also meet the general requirements for admission to the Faculty of Graduate Studies and Research.

(3) All candidates for the Postgraduate Diploma must complete a minimum of three courses one of which must be a paper course and one of which must be a regularly scheduled course.

(4) Courses will normally be completed in one academic year. In special circumstances the Committee for Postgraduate Diplomas may permit an extension of this time but in no circumstances may the time exceed three years.

(5) Inquiries may be directed to the Chairman of the Postgraduate Diploma Program in the Faculty of Law.

103.3.2 THE LL.B.—M.B.A. DEGREE

(1) The Faculty of Law in cooperation with the Faculty of Business Administration and Commerce and the Faculty of Graduate Studies and Research offers a program leading to both a Bachelor of Laws (LL.B.) and a Master of Business Administration (M.B.A.) degree.

(2) Applicants must apply to both schools independently and be accepted by both schools independently, based upon each Faculty's usual admission criteria. Students currently enrolled in either the Faculty of Law or the Faculty of Business Administration may apply to the other school, and, if accepted, be considered for admission to the joint LL.B.—M.B.A. program.

(3) In the first two years of the program, candidates will take the regular first year program offered by both schools, with the sequence being at the student's option. The third year will consist of a mixed program in both faculties and the fourth year will be in the Faculty of Law.

(4) Upon the successful completion of the third year candidates will receive the M.B.A. degree. Upon the successful completion of the fourth year candidates will receive the LL.B. degree.

(5) Inquiries regarding the joint LL.B.—M.B.A. Degree Program may be directed to the Chairman of the LL.B.—M.B.A. Degree Program in either the Faculty of Law or the Faculty of Business Administration and Commerce or to the Dean of the Faculty of Graduate Studies and Research.

103.3.3 THE DEGREE OF LL.M.

(1) The Faculty of Law offers a program of graduate study leading to the degree of Master of Laws.

(2) Applicants for this program must hold the degree of LL.B. or its equivalent from this or some other University, of sufficient standard to satisfy the Dean of the Faculty that they will be capable of undertaking and profiting by the program. They must also meet the general requirements for admission to the Faculty of Graduate Studies and Research.

(3) All candidates for the degree of Master of Laws must complete at least one academic year, i.e., normally one academic session from September to May, in residence at the University. In special circumstances the Dean of the Faculty may prescribe some longer period, or may permit the required period of residence to be spread over two consecutive academic sessions.

(4) To obtain the degree of Master of Laws candidates must submit and defend a thesis on a topic selected by themselves, subject to the approval of the Dean, in addition to attending courses throughout two terms, the number and character of such courses to be determined in consultation with the Dean.

(5) A candidate may select courses from a broad spectrum of legal subjects offered in the Faculty of Law as well as relevant subjects in other faculties.

(6) Financial assistance, including remission of fees, travel grants for candidates from outside the Province of Alberta, and Intersession bursaries, may be available to suitably qualified candidates. Such assistance will involve candidates in the performance of certain teaching or research duties in the Faculty of Law, though such duties will not impede candidates in the pursuit of their own studies. In addition, The University of Alberta offers certain scholarships to candidates of sufficiently high academic merit.

(7) Inquiries regarding programs, courses and financial assistance other than University scholarships should be made to the Director of Graduate Studies of the Faculty of Law. Inquiries about University scholarships should be made to the Dean of the Faculty of Graduate Studies and Research.

103.3.4 GRADUATE COURSES

Graduate courses include those offered in the Faculty of Law and law related disciplines which have been selected by a candidate in consultation with the supervisor and which have the consent of the Dean.

104 DETAILS OF COURSES

104.1 General Information

In each year students will enrol in optional courses in the numbers and terms indicated. In admitting students to optional courses, consideration will be given to their preferences but allocations will be made in such a way as to avoid large classes.

In the following list, courses included in Law programs are grouped according to the year of the program in which they are to be taken.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★", standing for "course weight", and a number indicating the weight of the course.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE FACULTY OF LAW.

104.2 First-Year Courses

An orientation program for first-year students wil occupy the whole of the first two weeks of First Term.

LAW 400. *Introduction to Law.* ★2 (First Term, 2-0-0). An intro duction to the legal system in Canada and the judicial pro cess. Emphasis will be placed upon a discussion of the doc trines of precedent and stare decisis and upon the rules an principles of statutory interpretation. In addition a portion c the course will be devoted to an examination of the technique utilized in legal research and legal writing.

LAW 410. *Contracts.* ★6 (3-0-0). A discussion of the prerequisites to the creation of contractual obligation: offer and acceptance, intention and certainty, consideration, the requirements of writing and capacity. The effect of misrepresentations and terms of the contract, together with the problems of exclusion clauses and of standard form contracts. Questions of discharge from contractual obligation on the grounds of mistake, undue influence, duress, unconscionable transactions and frustration. Remedies for breach of contract.

LAW 420. *Criminal Law and Procedure.* ★6 (3-0-0). A general introduction to the criminal law including pretrial procedures and practices; general substantive principles; criminal law and morality; trial procedure; double jeopardy; and sentencing.

LAW 430. *Torts.* ★6 (3-0-0). The law of negligence, damages, intentional interferences with persons, property and chattels, the law of strict liability, occupiers' liability, nuisance, defamation, the economic torts, the future of tort law.

LAW 435. *Constitutional Law and History.* ★4 (2-0-0). The nature of Canadian federalism under the British North America Act, basic principles of constitutional interpretation, and the division of legislative jurisdiction between Parliament and the legislatures. Emphasis is also placed upon the historic development of the Canadian institutional system.

LAW 440. *Real Property.* ★4 (2-0-0). The course involves a study of the basic principles of law which govern the institution of property in land and wealth derived from land. Rights incident to ownership and possession of land, tenures and estates, concurrent ownership, dower, leases and tenancies, easements, and restrictive covenants are examined. Historical antecedents are considered to the extent necessary to explain the modern law.

LAW 445. *Personal Property.* ★2 (First Term, 2-0-0). A study of the concept of possession as the central theme in the law of personal property. While emphasis will be placed on traditional areas of study such as acquiring title to wild animals, bailment, finder's law, and gifts inter vivos and mortis causa, a portion of the course will be devoted to the changing role of personal property in modern society.

104.3 Second and Third Year Courses

104.3.1 REQUIRED COURSES

A written work requirement is compulsory for each student in either the second or third year of the program. The paper must constitute at least 60% of the final grade in the course and a minimum grade of 5 must be obtained on the paper.

LAW 450. *Administrative Law.* ★4 (2-0-0). Designed to provide an understanding of the legal constraints courts have placed on the behaviour of administrative tribunals and government departments. *Topics to be discussed:* What is Administrative Law? How the courts supervise the acts and decisions of administrative bodies. Pitfalls to be avoided by administrative officers: errors of fact and law; excesses of discretion; breach of natural justice. How administrative acts and decisions may be attacked by an aggrieved citizen: remedies. Appeal and review, time limits, locus standi, choice of remedy, procedure. How to avoid attacks by aggrieved citizens. The practical outcome; strength of review. Recent trends in Administrative Law in Canada.

LAW 500. *Jurisprudence.* ★3 (either term, 3-0-0). An inquiry into the nature of law and legal obligation. The first part of the course is a survey of the major schools of Jurisprudence with particular emphasis upon positivism, natural law and legal realism. The second part consists of an examination of the modern applications of these theories, especially in relation to the process of judicial decision making and the question of whether there is an obligation to obey the law. Students who entered the Law Program prior to September 1978 will not be required to take LAW 500.

LAW 510. *Company Law.* ★4 (2-0-0). The law of partnerships, unincorporated associations, and limited liability companies. The incorporation of companies; relationships between the company and outsiders; and relationships of the members of the company within the corporate structure.

LAW 570. *Civil Procedure.* ★4 (2-0-0). The fundamentals of judicial procedure; the jurisdiction of courts, and the process of the courts. Clinical sessions. Rules of Court.

LAW 575. *Evidence.* ★4 (2-0-0). The adversary system in trial and appellate courts; relevance and admissibility; character evidence including similar facts; opinion evidence; the hearsay rule and its exceptions; illegally obtained evidence; judicial notice; burdens of proof and presumptions; quantum of proof; corroboration; competence, compellability and privilege; parole evidence of rule; oaths and affirmations.

LAW 600. *Conflict of Laws.* ★3 (either term, 3-0-0). Theoretical basis of conflict of laws. Preliminary Topics: characterization, renvoi, time element domicile. Choice of Law: domestic relations, contract, torts. Jurisdiction and the recognition of foreign judgments.

LAW 670. *Professional Responsibility.* ★2 (either term, 0-2s-0). A consideration of the responsibilities of the lawyer to his profession and the profession to the public. Ethics and organization of the profession.

104.3.2 OPTIONAL COURSES

In each term of second and third year a student load of course hours shall be a minimum of 14 and a maximum of 17. The total of course hours taken by a student in the second and third year shall amount to not less than 60. The Associate Dean of the Faculty of Law has discretion to make variations of this requirement in individual cases.

Under special circumstances, and subject to prior approval by the Associate Dean, a student may take optional courses in other Faculties of The University of Alberta only, for credit toward the degree of LL.B. Such courses will not exceed a total of three (3) credit hours in the entire LL.B. program and will be eligible as a substitute for optional courses in the Faculty of Law only if they are relevant to the discipline of Law.

Students shall select the balance of their course hours from among the following courses.

NOTE: Without some of these subjects e.g., LAW 540 (Land Titles), a student may have difficulty obtaining articles after graduation.

LAW 460. *Taxation.* ★4 (2-0-0). The scope and purpose of taxation. The taxing power; tax appeal procedures; constitutional problem. Personal jurisdiction. Property jurisdiction. Income from a business; statutory interpretation, deductions, expenses. Gift tax.

LAW 465. *International Law.* ★3 (First Term,3-0-0). The major objective of the course is to provide an overview of the basic machinery through which international law operates together with a review of principles which regulate the conduct of nations in their connections with one another. Topics to be covered include: definition, nature and sources of international law and their application in Canadian courts; international personality; state jurisdiction; nationality and individuals; the law of treaties; State responsibility and international claims; and pacific settlement of international disputes.

LAW 470. *Advocacy.* ★2 (either term, 2-0-0). The conduct of civil litigation including: interviewing and counselling, drafting pleadings, examinations for discovery, settlement attempts, preparation for court and participation in a mock trial. Emphasis on ethics and techniques of persuasion. Advocacy before tribunals and boards. Prerequisite: Completion of one of LAW 570 and 575 and enrolment in the other during the year in which Advocacy is being studied. LAW 570 and 575 may both be corequisites in second term.

LAW 480. *Equity.* ★2 (either term, 2-0-0). Historical introduction. Nature of equitable rights. Bona fide purchaser for value without notice *Qui Prior est tempore potior est jure*, and the rule in *Dearle* v. *Hall;* doctrines of conversion, election, performance, ademption, and satisfaction. Mistake, misrepresentation, fraud, and specific performance. Injunction, rectification, cancellation, account and receivership.

LAW 485. *Family Law.* ★3 (either term, 3-0-0). The formation and annulment of marriage; various matrimonial remedies; judicial separation; alimony; loss of consortium; divorce; ground and procedure; custody of children; financial obligations and property rights between spouses.

LAW 495. *Research Paper.* ★2 (either term, 2-0-0). This program will give selected second year students an opportunity to engage in original research. The research topic is subject to prior approval of a Faculty member who shall direct the students and the Associate Dean.

LAW 499. *Seminars on Specialized Legal Topics.* ★2 (either term, 0-2s-0). These seminars will cover a specialized topic of emerging importance in the law. The particular topic covered would vary dependent on the availability of Faculty with necessary teaching competence, student interest, and the needs of the legal profession.

LAW 505. *Legal History.* ★2 (Second Term, 2-0-0). An introduction to the historical development of law, from early times to the present day. Note: Students who have taken this course in first year must choose one of the other optional courses listed in this section.

LAW 512. *Trade Regulation.* ★2 (either term, 2-0-0). A study of the law regulating competition and anticompetitive business practices. While the common law restraint of trade doctrine is studied, the major part of the course is devoted to a study of those business practices prohibited or regulated by the Combines Investigation Act: price fixing, bid-rigging, price leadership, data dissemination agreements, resale price maintenance, price discrimination, predatory pricing, mergers and monopolization, refusal to deal, exclusive dealing, tied selling, market restrictions, and consignment selling. The legislation is studied with a view to analyzing its effectiveness in terms of competition policy. There is a comparative look at American antitrust law.

LAW 513. *Agency.* ★2 (Second Term, 2-0-0). The relationship of Principal and Agent. Capacity of parties. Appointment of agents. Married women as agents of their husbands. Delegation. Agents binding their principals; actual authority; ostensible authority and holding out; ratification. Undisclosed principals. Duties of agent to principal. Duties of principal to agent. Determination of agency.

LAW 515. *Commercial Law.* ★4 (2-0-0). The law of the sale of goods: nature of contract of sale, conditions and warranties implied by the Sale of Goods Act, passing of property and risk, documentary sales transactions, remedies of the buyer and the seller, circumstances under which a seller can pass a better title than he has. Credit and security transactions: assignment of book debts, chattel mortgages, and conditional sales contracts. Emphasis is placed on a study of the registration systems for security interests and special problems arising therefrom.

LAW 516. *Negotiable Instruments and Banking Securities.* ★2 (either term, 2-0-0). Law of Negotiable Instruments; Assignment of Choses in Action (including Assignment of Book Debts as a security device); unique banking securities; principal and surety.

LAW 517. *Creditors Rights.* ★3 (either term, 3-0-0). A general view of creditors rights and remedies, through: (1) Individual action, including attachment, garnishee, writs of execution, equitable execution, removal and sale, priorities of creditors, exemptions, and fraudulent conveyances and preferences, and (2) Collective action, including composition and extension agreements, provincial insolvency law, and bankruptcy.

LAW 518. *Intellectual Property.* ★2 (either term, 2-0-0). A study of the Law with respect to patents, trade marks, trade secrets, copyrights and intangible property generally.

LAW 519. *Insurance Law.* ★3 (either term, 3-0-0). General principles affecting insurance contracts including good faith, indemnity, subrogation, and insurable interest; particular problems arising out of the Alberta Insurance Act in relation to automobile, life and fire insurance.

LAW 520.*Criminal Trial Procedure and Advocacy.* ★2 (either term, 2-0-0). Practical aspects of criminal trial procedure and advocacy. Topics include: legal ethics; information and indictments; arrest and detention; judicial interim release; election and pleas; preliminary hearings; summary conviction appeals, jury trials; extraordinary remedies; miscellaneous problems in advocacy.

LAW 525. *Criminology.* ★3 (Second Term, 3-0-0). Sociological, biological and psychological causes of crime and, especially, the practical administration of the penal system in Alberta. Topics include police discretion, Indians and Metis, women, the practice of sentencing, juvenile delinquency and institutions, probation, adult correctional institutions, sociology of prisons, habitual prisoners, "psychopaths," therapeutic communities and group counselling, parole, social consequences of conviction and addiction treatment. The course include visitors and visits to institutions.

LAW 527. *Law and Psychiatry.* ★2 (Second Term, 2-0-0). T scope of psychiatry; classification and identification specific psychiatric problems, with special reference to t legal, ethical and social implications of psychiatric illness a the practice of psychiatry; the way in which the study of ps chiatry can be utilized in the practice of law.

LAW 531. *Law and Medicine.* ★2 (First Term, 2-0-0). Selecte topics pertinent to law and medicine with an emphasis on th practical implications of the law for the medical professi and the effect of changes in medical practice and institutio on the law. Problems will be examined with assistance fr professionals working in the relevant areas and recommend tions for law reform will be sought.

LAW 536. *Civil Liberties.* ★3 (Second Term, 3-0-0). Characte zation and classification of the civil liberties; protection of c liberties at common law; protection of civil liberties in the a ministrative process (for example, rules of natural justic protection afforded under the British North America A (implied Bill of Rights; special provisions respecti non-secular education, etc.; protection afforded through t constitutional division of powers); statutory provisions relati to equal protection and due process (Canada and Alberta B of Rights); anti-discrimination legislation (The Individua Rights Protection Act; proposal for a national human rig act); the institution of Ombudsman; the freedom of inform tion.

LAW 540. *Land Titles.* ★3 (either term, 3-0-0). A detailed stu of the Alberta Land Titles Act consisting of an analysis of t Common Law and Registry Systems of Conveyanci Introduction to the Torrens System of Land Titles; T Principles of Indefeasibility; Exceptions to Indefeasibil Boundary Problems; Caveats; Registrable Instrumen Miscellaneous Title Problems; The Assurance Fu Limitations of Actions.

LAW 543. *Basic Oil and Gas Law.* ★2 (First Term, 2-0-0). T origin, occurrence, and production of oil and gas; the nature interests in oil and gas; the acquisition and disposition interests in oil and gas; the rights and duties of parties un oil and gas leases; pooling of oil and gas interests; acquisit of surface leases and pipeline easements.

LAW 550. *Local Government Law.* ★2 (either term, 2-0-0). An amination of the theory, structure, organization and operat of the various types of municipal government units in ex ence in Alberta. Particular emphasis will be given to disqua cation of elected officers, powers of municipal governm units, attacking by-laws, legal proceedings as they relate municipal government units, and expropriation. Other ar are considered as time permits.

LAW 552. *Natural Resources Law.* ★2 (either term, 2-0-0). judicial, legislative, administrative and policy problems lated to the regulation and management of natural resourc including problems of allocation, development, use, pollu control, and conservation. Particular emphasis is placed water resources.

LAW 555. *Labor Law.* ★3 (either term, 3-0-0). Legal proble concerning the establishment of collective bargaining; nego ation and enforcement of the collective agreement; the ac ities of the union and employers in industrial disputes; and internal affairs of labor organizations.

LAW 556. *Labour Arbitration.* The law and practice relatin interest and rights arbitrations in Alberta. The course wil taught partly as a seminar and partly through a series of m arbitrations in which students will act as counsel.

LAW 558. *Poverty Law.* ★3 (either term, 3-0-0). The cultur poverty and its implications for anti-poverty planning wil examined with emphasis on psychological, sociological d economic theory. Organizational models for the deliveri legal services will be considered together with a treatmen the theory of equality, the problem of accessibility to "claims process" and alternative methods of disp settlement. The character of the law concerning the poor w be analyzed as reflected in selected case studies in welf law, public housing policy, workmen's compensation and employment insurance.

LAW 560. *Corporate Taxation.* ★3 (either term, 3-0-0). The consequences of corporation financing; amalgamati mergers, international business transactions; tax plan from a corporation and personal standpoint; and trends in ation. Prerequisite: LAW 460.

LAW 565. *International Business Transactions.* ★2 (Second Term, 2-0-0). The purpose of the course is to study the legal issues and implications arising out of Canada's International trade and transnational activities of private capital both Canadian and foreign. 1. The Legal Basis of International Trade: A study of the General Agreement on Tariffs and Trade (G.A.T.T.) system and subsequent multilateral trade negotiations. 2. Regional Trade and Economic Organizations. 3. Legal Barriers to Private Investment Abroad.

LAW 580. *Trusts.* ★3 (either term, 3-0-0). A brief survey of the historical development of the trust. Definition and classification of Trusts. Creation of express trust — the three certainties. Completely and incompletely constituted trusts. Secret, protective, discretionary and illusory trusts. Charitable trust and the rule against perpetuities. Cy-pres doctrine. Non-charitable purpose trusts. Implied or resulting trusts. Constructive trusts. Revocation, termination and variation of trusts. The appointment, retirement and removal of trustees. Duties, discretion and powers of trustees. Breach of trust.

LAW 582. *Wills and Administration.* ★3 (either term, 3-0-0). Principles of the Wills Act, including formalities of execution, revocation, revival, republication, types of legacies, and principles of construction. Testamentary capacity, fraud, and undue influence. Drafting of wills. Appointment of executors and administrators, their powers and duties; probate practice.

LAW 585. *Women and the Law.* ★2 (either term, 2-0-0). This course will start with a historical evaluation of how the law has particularly affected women and continue to an in-depth analysis of the present day situation in Canada and particularly Alberta. Topics to be covered will include discriminatory laws — express and de facto; the criminal law — substantive law and penal reform; domestic relations — protection of consortium, inter spousal actions, marriage contracts, property laws, rights in common law unions, affiliation proceedings; anti-discrimination laws; labor law and affirmative action programs. A comparative analysis will be stressed throughout. It is preferable if a student has taken Family Law.

LAW 586. *Children and the Law.* This course will include a review of the case law and legislation in the areas of neglect, guardianship, custody, adoption, juvenile delinquency and legal capacity.

LAW 595. *Research Paper.* ★2 (either term, 2-0-0). This program will give selected third year students an opportunity to engage in original research. The research topic is subject to prior approval of the Associate Dean and the Faculty Supervisor. The research topic shall be different from that used in LAW 495 and have a different Faculty Supervisor.

LAW 599. *Seminars on Specialized Legal Topics.* ★2 (either term, 0-2s-0). These seminars will cover a specialized topic of emerging importance in the law at a senior level. The particular topic covered would vary dependent on the availability of Faculty with necessary teaching competence, student interest, and the needs of the legal profession.

LAW 605. *Comparative Law.* ★2 (either term, 2-0-0). A comparsion of civil law and common law systems, with the Quebec example serving as the focal point for discussion and examination. The seminar concerns itself with particular illustrations from which to draw general conclusions. Its object is to broaden the common law horizon by providing an insight into the workings of the civil law.

LAW 611. *Corporate Finance.* ★2 (either term, 2-0-0). The financing of companies (with special reference to Alberta private companies). An analysis of share structure. Methods of raising funds and security therefor, including mortgages and debentures. Enforcement of security. Shareholder agreements and the minority shareholder. Purchase and sale of shares and corporate assets. Distributions to shareholders. Prerequisite: LAW 510.

LAW 612. *Securities Regulation.* The course will study the basic technique of regulating the trading of securities. It will briefly consider the history and evolution of securities legislation as a base for examining the concept of the public underwriting, the roles and responsibilities of the parties in the underwriting and its place in the capital market structure. A combination of lecture and class discussion will require student preparation for each session.

LAW 615. *Advanced Commercial Law.* ★2 (Second Term, 2-0-0). Selected topics in Commercial Law. Prerequisite: LAW 515.

LAW 620. *Advanced Criminal Law.* ★2 (Second Term, 2-0-0). The course comprises an examination of substantive criminal law particularly: offences against the person and rights of property; the jury system; juvenile justice and quasi-criminal proceedings; and, the extraordinary remedies.

LAW 625. *Seminar in Criminal Justice Administration.* ★4 (0-2s-0).

LAW 630. *Advanced Torts.* ★2 (either term, 2-0-0). An analysis of, and problems in, the Law of Torts.

LAW 635. *Advanced Constitutional Law.* This course will be conducted on a seminar basis and will examine particular problems in Canadian federalism of contemporary significance.

LAW 637. *Seminar in Advance Problems in Constitutional Law.* ★4 (0-2s-0).

LAW 640. *Real Estate Transactions.* ★3 (either term, 3-0-0). The law governing agreements for sale of land; the open contract of sale, implied terms, special covenants in agreements for sale. Remedies of vendors and purchasers; election of remedies; cancellation and determination clauses. Deposits and instalments. Mortgages: legal, equitable and statutory. Foreclosure; sales; redemption; possession and attornment. Prerequisite: LAW 540.

LAW 643. *Advanced Petroleum Law.* ★2 (either term, 2-0-0). The acquisition of Petroleum Interests from the Crown; the terms of operating and developing agreements; conservation legislation and practices including unitization and prorationing; the regulation of the natural gas industry; the pipeline and marketing of petroleum products. Prerequisite: LAW 543.

LAW 644. *Seminar in Comparative Petroleum Legislation.* ★4 (0-2s-0).

LAW 650. *Land Use Planning Law.* ★2 (either term, 2-0-0). Discussion centres around the theory of land use planning and its present and future prospects as a means of insuring the quality of man's environment. The structure, organization and operation of the various planning agencies, planning techniques such as the general plan, zoning, development control and subdivision control and the lawyer's role in the planning process are considered. Hypothetical development projects are put forward for solution which take the student through the various stages of a project from obtaining the necessary approval from the planning authorities through financing of the project to its completion.

LAW 660. *Estate Planning.* ★2 (either term, 2-0-0). A review of the objectives of estate planning; study of various estate planning techniques with the use of hypothetical problems; an examination of provisions found in the Income Tax Act which affect estate planning, estate tax, and gift tax. Prerequisites: LAW 460, LAW 510, LAW 580, and LAW 582.

LAW 665. *International Law Problems.* ★2 (either term, 2-0-0). A research seminar dealing in depth with a problem in international law (the specific topic will be announced each year). Designed to train students in the use and evaluation of international legal materials. A paper will be required

LAW 680. *Restitution and Remedies.* ★3 (either term, 3-0-0). A study of the development and application of the idea of unjust enrichment and the circumstances in which a remedy is available irrespective of an action in tort or contract. This includes quasi-contractual recovery, tracing, and the use of the constructive trust.

LAW 685. *Problems in Family Law.* ★2 (either term, 2-0-0). Selected topics and problems relating to Domestic Relations including the Family, Juvenile Delinquency, in-depth analysis of Divorce, Women and the Law. Prerequisite: LAW 485.

LAW 695. *Research Paper.* ★2 (either term, 2-0-0). This program will give selected graduate students an opportunity to engage in original research. The research topic is subject to prior approval of the Faculty supervisor and the chairman of the Graduate Studies Committee. The research topic shall be different from the thesis topic.

LAW 699. *Seminars on Specialized Legal Topics.* ★2 (either term, 0-2s-0). Graduate Level. These seminars will cover a specialized topic of emerging importance in the law. The particular topic covered would vary dependent on the availability of Faculty with necessary teaching competence, student interest, and the needs of the legal profession.

INT D 468. *Principles of International Humanitarian Law. Course to be administered by the Department of Political Science — "The historical background and humanitarian intervention; human rights; the law of war; international criminal law."*

104.4 *Graduate Courses*

At the discretion of the Graduate Students Committee or the Postgraduate Diploma in Law Committee, any Law course (at the 400 level or above) may be considered a graduate course.

104.5 *Non-LL.B. Courses*

The following courses, normally offered in Spring and/or Summer Session, are available to students in other faculties. They will not be considered for credit in the LL.B. program.

LAW 300. *Law for Non-LL.B. Students I.* ★3. The nature, functions, and sources of law; an outline and components of the Canadian legal system. Note: Not available for credit in the LL.B. Program.

LAW 301. *Law for Non-LL.B. Students II.* ★3 Topics to be covered will be chosen from among the following: Morality, Obscenity and the Law; Industrial Relations; the Law and the Family; the Law as a Protector; Freedoms allowed under the Legal System; the Law and the Environment. Prerequisite: Normally, LAW 300 would be a prerequisite but this requirement may be waived at the discretion of the instructor. Note: Not available for credit in the LL.B. program.

LAW 302. *Law for Education Students I.* ★3. A thirty hour course involving introduction to the sources of law, legal history, the legal system and the role of law. A substantive area of law would be studied in depth to illustrate these matters more clearly. Topics covered would include — What is Law, Sources of Law, Origins of Law, i.e., the development of the common law and its reception to Canada, The Canadian Legal System, The Relationship of Law and Society. Note: Not available for credit in the LL.B. Program.

LAW 303. *Law for Education Students II.* ★3. A course of thirty hours which would involve an examination of several substantive areas in law both to give the student a better understanding of the legal system and to enable the student better to teach law in the high school. Normally, LAW 302 would be a prerequisite for LAW 303 but this requirement could be waived at the discretion of the instructor. Note: Not available for credit in the LL.B. Program.

LAW 304. *Law for Education Students III.* ★3. A self-study course of thirty hours involving the preparation of a paper under the supervision of a member of the Faculty of Law. Prerequisite: Normally LAW 303, but may be waived at the discretion of the instructor. Note: Not available for credit in the LL.B. program.

Faculty of Library Science

111 INTRODUCTORY

111.1 Members of the Faculty of Library Science

111.1.1 STAFF

Professor and Dean
W. J. KURMEY, B.Sc., A.M.(L.S.)

Professors
R. E. BRUNDIN, A.B., M.J., M.L.S., Ph.D.
M. E. P. HENDERSON, B.L.S., M.A., LL.D.
J. G. WRIGHT, B.Ed., M.S.
S. E. WRIGHT, B.A., M.L.

Associate Professors
S. K. BERTRAM, B.Sc., B.L.S., M.S., Ph.D.
A. NITECKI, M.A.
G. M. STRATHERN, B.A., Dip., N.Z.L.S., A.N.Z.L.A.

Adjunct Associate Professor (University Archivist)
J. PARKER, B.A., M.A.

Assistant Professors
C. de SCOSSA, B.A., B.L.S., M.L.S.
R. INSKIP, B.A., M.L.S.

Lecturer
J. HENRY, B.Ed., M.A.

111.1.2 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Professors
D. H. BENT, B.Sc., M.Sc., Ph.D. (Computing Services)
L. G. WIEDRICK, B.A., B.L.S., B.Ed., M.S., Ed.D. (Education)

Associate Professor
D. CULLEN, B.A., M.S., Ph.D. (Business Administration and Commerce)

Librarian to the University
B. B. PEEL, M.A., B.L.S.

Librarian in Music
J. WHITTLE, B.Sc., B.Mus., B.L.S.

Provincial Archivist
A. RIDGE, B.A., Dipl. in Archives Administration, Certified Records Manager (ARMA)

Representatives
E. HUMPHREY, B.A., B.L.S. (Library Association of Alberta)
M. SHARROW, B.S., M.L.S. (Manitoba Library Association)
G. RAY, B.A., A.L.A. (Saskatchewan Library Association)

Registrar of the University

111.2 General Information

111.2.1 HISTORICAL NOTE

The Faculty of Library Science, the only professional library school in the prairie provinces, offers the Master of Library Science Degree.

The first classes in a Bachelor of Library Science program began in 1968. In 1970 the B.L.S. program was accredited by the Committee on Accreditation of the American Library Association and was thus recognized by the American and Canadian Library Associations as meeting library education standards.

In 1971 the Faculty initiated a Master of Library Science program for which the B.L.S. program was the qualifying year. In 1976, in keeping with the Canadian pattern of education for librarianship, the B.L.S. was discontinued, and the present two-year M.L.S. program was instituted.

As the first professional degree, the M.L.S. represents a program designed to develop the knowledge, understanding, attitudes, and skills that will prepare graduates for positions of responsibility in school, public, academic, and special libraries. The M.L.S. program was accredited by the American Library Association in January, 1979.

111.2.2 GOALS AND OBJECTIVES

The general goal of the Faculty is to provide learning experiences that will assist its graduates to assume responsibility and leadership in meeting the information needs of a changing society. The Faculty acknowledges its responsibility to provide such experiences based upon a continuous exploration of library functions and services, and its responsibility to undertake the necessary planning and research. These responsibilities include provision for the continuing education needs of practising librarians.

The specific objectives of the M.L.S. degree program are:

(a) To provide a theoretical and methodological base which will enable students to analyze problems, design solutions, and adapt library principles to changing social conditions;
(b) To prepare students to select, organize, and disseminate information, and to develop and administer programs of service in the light of changing public needs and demands;
(c) To prepare students for professional positions in librarianship and cognate fields.

111.2.3 STUDENT ORGANIZATIONS

There is an organization for all students enrolled in the Faculty of Library Science. Students elect their own officers, with the presiding officer representing them at

meetings of the Faculty Council. The organization provides liaison between students and faculty and encourages participation in a variety of academic, professional and extracurricular activities.

In addition to the regular student organization, there is an official University of Alberta Student Chapter of the American Society for Information Science (ASIS), which was founded by students in the Faculty of Library Science. The Chapter, which was chartered by the ASIS Council in May 1977, serves interested students in the Greater Edmonton area and provides special programs relating to modern methods of information processing such as computer-based procedures and reprographic techniques.

111.2.4 LABORATORY-LIBRARY

The Faculty of Library Science maintains a laboratory-library which provides, in addition to library space, facilities for group and individual work and study. The collection, designed to supplement that of the University Libraries, includes some 10,000 volumes and a full range of audiovisual materials. The collection is composed of standard library and information science, sample reference and selection tools, periodicals, annual reports, and materials for children and young people.

111.2.5 UNIVERSITY LIBRARIES

The libraries of The University of Alberta contain more than 2,000,000 volumes, 500,000 documents, 15,000 periodical subscriptions, audiovisual aids and a large collection of research materials in microform.

The Humanities and Social Sciences Library is located in the Rutherford Library complex with some units in the Cameron Library. The main book collection and the union catalogue for the campus are located in Rutherford Library North. Here also, on the second floor, are the Reference and the Circulation Services. The Periodicals Reading Room, located on the 2nd floor of Rutherford South, contains current issues of periodicals in the humanities and social sciences plus recent issues of Canadian and foreign newspapers. Bound periodicals are located on the second floor and tiers 4, 5 and 6 of Rutherford South.

In the Cameron Library the Humanities and Social Sciences collections include Government Publications on the third floor and the Micromaterials Reading Rooms in the basement. The Cameron basement also houses Special Collections, Interlibrary Loan service, and Duplicating Services.

In the Cameron Library, the Undergraduate Library on the second floor contains an open shelf collection specially selected to meet the needs of undergraduates during their first two years of study. The Reserve Reading Room on the first floor houses books which are assigned by the instructors as required reading in the arts and sciences.

The Science Library occupies part of the third and the fourth floor of the Cameron Library, and contains material for use in the fields of agriculture, engineering, science, home economics and other related subjects. The head of this Library is also responsible for two small branch libraries in related fields; the Mathematics Library located in the Central Academic Building, and the Physical Sciences Library in the Physics-Chemistry Building.

The Health Sciences Library on the fifth floor of the Cameron Library houses books and periodicals in the fields of medicine, dentistry, nursing, pharmacy, rehabilitation medicine and health services administration. This Library operates one branch, the John W. Scott Library, at the University Hospital which may be used by all recognized University Library patrons, but is mainly for use by the faculty and house staff at the hospital.

The Weir Memorial Law Library is housed in the Law Centre located on 111th Street. The Law Library contains reports, statutes, digests, encyclopaedias, treaties for Canada, the provinces, Great Britain and many of the other Commonwealth countries. United States' materials include the National Reporter system, the American Digest, Shepards Citator, annotated state codes, federal statutes and regulations. Over 1,200 periodicals are received with complete files of the major periodicals. Special subject collections are being established in: Oil and Gas Taxation, International Law and Comparative Law.

The other major library on the campus is the Herbert T. Coutts (Education) Library which occupies the three-storey east wing of the Education Building. Circulation and reference services as well as a card catalogue of the Library's holdings are maintained here. The head of this Library also supervises the Curriculum Materials Library on the lower floor of the building.

111.2.6 FACULTY COMPUTING FACILITIES

The Faculty of Library Science has three computer terminals of its own; two print terminals (one stationary, the other portable) and a CRT terminal. All operate at 30 characters per second through acoustic coupler and standard voice-grade telephone lines. They are available to faculty members and students for instruction, research, and demonstrations, both with the University's computing facilities and also with external data bases. Access is provided to such external services as those of Lockheed, Infomart (SDC), OCLC, CAN-OLE, and others.

111.2.7 UNIVERSITY COMPUTING SERVICES

The Department of Computing Services, located in the General Services Building, is maintained by The University of Alberta as a service facility for the faculty, research staff and students at the University. It provides and operates a computing system that attempts to meet the needs of education and research groups in the University and in the community. Users of Computing Services are required to adhere to the "Conditions of Use" policy. Administrative data processing for the University is done by the office of Administrative Systems (OAS).

Computing Services operates an Amdahl 470V/6 computer with 8 million bytes of memory, under the Michigan Terminal System (more commonly known as MTS). Over 500 computer terminals located in departments across campus provide remote access.

At the central location there are also card readers for batch input, printers (including a Braille printing facility), drums, tape drives, disk drives and a comprehensive telecommunications sub-system. Other facilities include a digitizer, an optical mark scorer, an incremental plotter, an interactive graphics display, an electrostatic printer/plotter, a paper tape reader/punch and numerous keypunches and terminals for the use of staff and students. The Department also provides services such as keypunching, text and data entry, contract programming, debugging and consulting, remote terminal maintenance and support, systems development and maintenance, an applications program library, a fast batch facility and tape storage. Non-credit courses and seminars are offered and user documentation is provided.

112.1 Classification of Students

112.1.1 GENERAL CLASSICATION OF GRADUATE STUDENTS

Graduate students at The University of Alberta are classified in one of the following six categories:

(1) *Qualifying graduate student.* A student who holds a three year bachelor's degree from The University of Alberta, or a similar qualification from some other institution, may be admitted as a qualifying graduate student. A graduate of a four-year program entering a completely new field may also be admitted as a qualifying graduate student. On satisfactorily completing a qualifying year in the department, a student may be reclassified as a probationary graduate student or as a candidate for a master's degree.

(2) *Probationary graduate student.* Such a student is one whose academic record is either (i) difficult to assess, as in the case of some foreign students, or (ii) below the standard normally required. After the completion of one academic year, probationary graduate students who have proved their competence to the satisfaction of their department and the Faculty may be accepted as a candidate for a master's degree or a provisional candidate for a doctor's degree. If accepted then on the recommendation of the department, they may have courses completed during their probationary year credited towards the requirements for a degree. Each such application will be considered on its merits.

(3) *Candidate for a master's degree (Category A).* Such a student is one who is a graduate of a 4-year degree program continuing in the same field (equivalent of an honors degree or degree with specialization of The University of Alberta). (See § 15.2.10 of the Faculty of Graduate Studies and Research Calendar.)

(4) *Candidate for a master's degree (Category B).* Such a student is one who is a graduate of a 4-year degree program (beyond senior matriculation), specializing for the first time but not requiring a qualifying year. (See § 15.2.10 of the Faculty of Graduate Studies and Research Calendar.)

(5) *Special graduate student.* Such a student is one who is in every respect eligible for admission to the Faculty and who, though not registered in a degree program at this University, takes one or more *graduate* courses, with the permission of the department concerned.

(6) *Exchange graduate student.* Such a student is a bona fide student of another university or college who has been permitted to take one or more courses for transfer of credit to his/her own institution which has agreed in advance to such an arrangement.

112.1.2 CLASSIFICATION OF LIBRARY SCIENCE STUDENTS

Students admitted to the first year of studies in library science are classified as qualifying graduate students. Upon completion of the first year of work students will be reclassified as either probationary graduate students or as candidates for a master's degree (Category A).

Students admitted to the program who already hold the B.L.S. degree, are classified as either probationary graduate students or as candidates for a Master's degree (category A).

112.1.3 APPLICANTS WITH THE B.L.S. DEGREE

Applicants with a B.L.S. degree from an accredited library school or its equivalent, and an academic record acceptable to the Faculty of Graduate Studies and Research and the Faculty of Library Science will normally be admitted as Candidates for the M.L.S. degree and should be able to complete the required work in one year.

Students who cannot enroll in at least three half-courses per term (full-time attendance), and whose employment relates directly to their academic studies, may petition the Faculty of Graduate Studies and Research to have the normal residency requirement waived. Petitions should be made through the Dean of the Faculty of Library Science.

112.2 Admission

112.2.1 ADMISSION REQUIREMENTS FOR M.L.S. PROGRAM

(1) The applicant must have a Bachelor's degree from a recognized institution of higher learning, with academic standing acceptable to the Faculty of Graduate Studies and Research and the Faculty of Library Science. In some instances the University is prepared to admit students who have achieved high scores on the Graduate Record Examination Aptitude Tests.

(2) In preparing for a Master of Library Science degree program, students are advised to include courses distributed among the social sciences, biological and physical sciences, literature and other areas of the humanities, and also to major in one of these subjects.

(3) A reading knowledge of a modern language other than English is advisable. Reading knowledge is assumed if a student has completed French 200, German 200, Russian 300, or, at an equivalent level, any other modern language acceptable to the Faculty of Library Science. French, German, and Russian are particularly useful in bibliographic work.

(4) All applicants with degrees from other countries must take the Graduate Record Examination Aptitude Tests administered by the Educational Testing Service (see 3 below). Students should arrange for the testing agency to report results to the Faculty of Library Science, which will judge whether or not the results are satisfactory.

(5) Preference is given to applicants who have had library experience under professional supervision before registration. Such experience tests a candidate's aptitude for library work and gives some knowledge of library terminology and processes.

(6) Applicants are judged not only upon their academic record but also by their professional promise as indicated in three letters of reference. A personal interview, arranged at a time and place convenient to the applicant, may also be required.

(7) Since there is a quota on the number of students in the Faculty of Library Science, The University of Alberta cannot guarantee admission to the Faculty for all fully qualified applicants.

112.2.2 GENERAL ADMISSION REQUIREMENTS FOR THE FACULTY OF GRADUATE STUDIES AND RESEARCH

The requirements for admission as a graduate student are:

(1) A baccalaureate degree, with a grade point average of at least 6.0 in the work of the last two undergraduate years at The University of Alberta, or an equivalent qualification from another institution, and

(2) A statement from the chairman of the department concerned to the effect that the applicant is, in all respects, acceptable to the department. A special graduate student or an exchange graduate student, however, not being a candidate for a degree, does not require departmental recommendation.

(3) All *non-Canadians* for whom English is not the major language (a) first *must* write and pass satisfactorily either the Michigan English Language Examination (The Director Testing and Certification Division, English Language Institute The University of Michigan, Ann Arbor, Michigan 48104, U.S.A.) or the Test of English as a Foreign Language (TOEFL, Educational Testing Service, Princeton, New Jersey 08540, U.S.A.) before formal admission can be given, and (b) in addition, if formally admitted must arrive on campus and write, *one week before registration,* an English Language Examination set and administered by The University of Alberta. Students whose performance is unsatisfactory in this English Examination will be allowed to continue their graduate work, but may be required to take English language instruction as part of their regular program.

112.2.3 APPLICANTS WITH A GRADUATE DIPLOMA IN SCHOOL LIBRARIES

Applicants admitted with a Graduate Diploma in School Libraries from the Faculty of Education with standing acceptable to the Faculty of Graduate Studies and Research and to the Faculty of Library Science, may be granted advanced standing towards an M.L.S. degree.

112.2.4 APPLICATION FOR ADMISSION

Application for admission must be submitted on forms supplied by the Dean of the Faculty of Graduate Studies and Research. No assurance can be given that applications received after August 15 (for First Term, Winter Session), November 15 (for Second Term, Winter Session), March 1 (for Spring Session) or April 2 (for the Summer Session) can be processed in time to permit registration in that session. A graduate of another university must arrange with the Registrar of that institution to forward two transcripts of his/her academic record to the Dean of the Faculty of Graduate Studies and Research prior to these dates. The Dean of the Faculty of Graduate Studies and Research may require the applicant to furnish an official description of the content of the courses listed on the transcripts.

112.2.5 DEPOSIT

Applicants, when notified that their application has been accepted, shall pay a *deposit of $50.00* to The University of Alberta submitted directly to the Faculty of Library Science. This amount will be credited toward payment of tuition upon registration, or be forfeited in full if the student fails to register.

112.2.6 REFUSAL OF ADMISSION

Notwithstanding the Admission Requirements referred to above, The University of Alberta may at its discretion refuse admission to any applicant.

112.3 Registration

Particulars will be provided when a student is officially admitted to the Faculty. On entering the M.L.S. program all students are assigned a faculty advisor who will assist them in planning their course of studies.

112.3.1 CHANGES OF REGISTRATION

Deletion of courses, changes from "credit" to "audit", or changes from "audit" to "credit", may be made only on recommendation of the department in which the student is taking the graduate degree.

Such changes of registration, first approved by the Department Chairman, must be received by the Faculty of Graduate Studies and Research no later than six weeks prior to the date of the final lecture in the course(s) involved: October 19 for First Term courses, February 15 for Second Term and full-session courses. *No credit will be given for any course unless it is included on the program form or covered by an official change of registration.*

Only in special cases supported by the department and approved by the Faculty of Graduate Studies and Research will a student be allowed to add a First Term or a full-session course to the program after September 18. The deadline date for the addition of new Second Term courses is January 28.

NOTE: Individual departments may require an earlier deadline date for changes in course registration.

112.3.2 MAINTENANCE OF REGISTRATION

Every student on a graduate degree program must register once a year in order to keep the program active. This registration entitles the student to the use of University facilities and to assistance from his/her supervisor for a twelve month period. Registration during the final year of the program permits the student to graduate at either of the two following Convocations.

The procedure for re-registration is the same as for initial registration, and students must obtain a program form from their department and present it at registration even if they are registering for thesis only.

Students who fail to maintain continuous registration will be considered to have withdrawn from their program. If they wish to resume work on the program, they must apply for re-admission to the Faculty of Graduate Studies and Research and have their program re-assessed in terms of the regulations in force at the time of re-application. If they are recommended for re-admission, a re-admission fee of $70.00 will be charged in addition to the fees assessed in the regular manner.

112.3.3 MAY-AUGUST SUMMER PERIOD

Graduate students who are working full-time on the graduate program during part or all of the period from May to September are encouraged to record their presence on campus at their departmental office. Those holding University awards during this period *must* so record their presence. Residence credit may be given for this period if the student has signed the record.

112.3.4 CANCELLATION OF REGISTRATION

A student who wishes to withdraw from the University should complete "Notice of Withdrawal" forms which must then be submitted to the Dean for approval. A student who withdraws without completing such forms will not be eligible for any refund of fees, nor for exemption from fees in the event that they have not been paid.

A fee adjustment will be made and refunds will be authorized in accordance with the table published in § 15.2.5 of the Faculty of Graduate Studies and Research Calendar. The date used for the purpose of calculating the refund is that on which the withdrawal is approved by the Dean.

112.4 Academic Standings

Except in a qualifying year, the pass mark in *any* course taken for credit towards an advanced degree is a grade of 6. Grades of 5 may be accepted in two single-term courses or one full-session course provided a minimum average of 6.0 is acquired at the time of completion of work for the degree. In this connection the student should keep in mind that courses are weighted differently. Thus a grade of 7 in a session or term course does not necessarily bring one's average up to 6.0 if a grade of 5 was received in another course which carried a greater weight. In a qualifying year, a grade of 4 or 5 may be accepted in an individual course, provided that the grade point average for the year's work is at least 6.0. (Note: The above are *minimum grades* which the Faculty will accept. Individual departments may require higher grades than these.) A grade of 4 obtained by Probationary, Special, or Exchange, Graduate Students will be recorded as a failure.

Graduate students are not permitted to take supplemental examinations. If, after consulting the department or the committee concerned, the Faculty decides that a graduate student is not making satisfactory progress in either course work or research, the student may be required to withdraw.

112.5 Academic Appeals and Grievances

A student who believes he or she has an academic grievance should first approach the instructor concerned. Failing satisfaction, he or she should then take his/her case to his/her Faculty advisor, then the Dean of the Faculty of Library Science and the Dean of the Faculty of Graduate Studies and Research, in that order. Beyond this, the appeal should be made directly to the Academic Appeals Committee of the General Faculties Council. (See also § 16.7 "Appeals and Grievances" as found in the University Regulations and Information for Students Calendar).

112.6 Time Limit

To be recommended for a Master's degree, a candidate must have completed all the requirements within four years of the time he/she is first registered as a probationary graduate student or candidate in the Master's program.

113 PROGRAMS OF STUDY

113.1 The Degree of M.L.S.

The Faculty of Library Science offers a two-year (four-term) program for university graduates leading to the degree of Master of Library Science (M.L.S.).

A full time student who is registered for the M.L.S. degree program will normally be able to complete degree requirements in two years. During the qualifying year students will be required to take five full courses or their equivalent (ten half courses). During the Candidacy year students will be required to take the equivalent of ten half courses, and spend a minimum of two terms in full-time attendance. Students may, with approval, include up to two full courses in a faculty other than the Faculty of Library Science. The program includes provision for both a thesis and non-thesis option.

Credit for courses taken elsewhere may be granted as advanced credit by the Dean of the Faculty of Graduate Studies and Research on the recommendation of the Faculty of Library Science provided that the courses have not been counted towards a previous degree. (Please note the special provision for applicants with the B.L.S. degree.)

Inquiries regarding program and course details and financial assistance other than University scholarships should be made to the Dean of the Faculty of Library Science. Inquiries about University scholarships should be made to the Student Awards Office.

113.2 The Degree of M.L.S. (Learning Resources)

The Faculty offers a designated Master of Library Science in Learning Resources for candidates with an Alberta Professional Teaching Certificate, or its equivalent, and a Diploma with a specialization in school libraries from the Faculty of Education.

114.1 General Information

In the following list of courses, each course is designated by the abbreviation for Library Science and its number. This abbreviation and number should be used by the student when filling in registration forms.

Following the title of the course is the symbol "★", standing for "course weight", and a number indicating the weight of the course as used in calculating grade-point averages.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: The first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. If the course is a single term course, the term in which it is offered is mentioned.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS CONCERNED AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE FACULTY OF LIBRARY SCIENCE.

114.2 The M.L.S. Programs

The following courses are required for both the thesis and non-thesis routes of the M.L.S. and the M.L.S. (Learning Resources): LIB S 401, 411, 421, 461, 462, 471, one of LIB S 412, 431, 432, 433, 434, 435, 436, 437, one of LIB S 441, 442, 444, 445. In the thesis route, 000 is required; in the non-thesis route, 900 is required. Not all the courses listed in the calendar will be offered in any one year.

GRADUATE COURSES

LIB S 401. *Technical Services.* ★3 (First Term, 3-0-1). To introduce students to the mechanics of technical services including identification, acquisition, cataloguing, classification and circulation of library materials.

LIB S 402. *Building Library Collections.* ★3 (First Term, 3-0-0). To develop an analytical approach to collection building and to explore acquisition methods with particular reference to the Canadian scene. Prerequisite: LIB S 401.

LIB S 403. *Cataloguing and Classification.* ★3 (Second Term, 3-0-0). To prepare students to construct a catalogue and to describe and classify various forms of library materials for either manual or computerized library situations. Prerequisite: LIB S 401.

LIB S 411. *Reference Services.* ★3 (First Term, 2-1s-0). To understand the functions of reference services in libraries, and to become familiar with examples of major reference sources.

LIB S 412. *Storytelling.* ★3 (either term, 3-0-0). To enable students to select, prepare, and present stories.

LIB S 421. *Management of Library Organizations.* ★3 (First Term, 2-1s-0). To introduce representative management theories applicable to library organizations.

LIB S 423. *Archives Administration.* ★3 (either term, 3-0-2). To develop an understanding of archival records and their role in the field of information.

LIB S 431. *Canadian Materials: Special Aspects.* ★3 (Second Term, 3-0-0). To survey the range of Canadian materials, and to enable students to evaluate these materials.

LIB S 432. *Survey of Materials for Children.* ★3 (either term, 3-0-0). To develop a knowledge and appreciation of materials for children in terms of their needs and interests.

LIB S 433. *Materials for Young Adults.* ★3 (First Term, 3-0-0). To survey current literature in all media forms which appeal to adolescents of junior and senior high school age.

LIB S 434. *Adult Materials.* ★3 (Second Term, 3-0-0). To develop an awareness of the recreational, educational and professional library needs of adults (including the less specialized needs of the high school, college and university community), and of the materials available to meet the needs.

LIB S 435. *Materials in the Social Sciences.* ★3 (Second Term, 3-0-0). To understand the nature, function and communication patterns of social sciences and to be able to select, organize and effectively use relevant materials. Prerequisite: LIB S 411.

LIB S 436. *Humanities in the Library.* ★3 (Second Term, 3-0-0). To understand the nature and function of the humanities and to be able to select, organize and effectively use the printed materials or objects relevant to the humanities. Prerequisite: LIB S 411.

LIB S 437. *Science Literature.* ★3 (Second Term, 0-3s-0). To introduce the literature and the nature of science to the non-scientist. Prerequisite: LIB S 411.

LIB S 441. *Public Libraries.* ★3 (Second Term, 3-0-0). To develop an understanding of public libraries and public library systems, their structure and management. Prerequisite: LIB S 421.

LIB S 442. *Academic Libraries.* ★3 (Second Term, 2-1s-0). To develop an understanding of the nature and functions of university and community and technical college libraries. Prerequisite: LIB S 421.

LIB S 444. *Special Libraries.* ★3 (Second Term, 3-0-0). To develop an understanding of the special library, its purpose, structure and management with emphasis on services. Prerequisite: LIB S 421.

LIB S 445. *School Media Centres.* ★3 (Second Term, 3-0-0). To examine the concept and organization of media resource centres in elementary and secondary schools. Prerequisite: LIB S 421 *and* Teaching Certificate.

LIB S 451. *History of Libraries.* ★3 (First Term, 3-0-0). To examine the development of libraries and librarianship in response to social needs in the Western world.

LIB S 452. *History of the Book.* ★3 (First Term, 3-0-0). To describe the historical, esthetic and economic bases of the book and its role in the recording and preservation of knowledge and ideas.

LIB S 461. *Practicum.* ★3 (0-3s-0). First Term: Use of Library Resources: To provide basic skills in using library and bibliographic resources. Second Term: Field Study: To provide opportunity for practical experience in a library under the direction and supervision of a qualified librarian.

LIB S 462. *Research and Systems Evaluation.* ★3 (Second Term, 3-0-0). To develop an ability to understand the nature of research and its methodologies and techniques used in librarianship.

LIB S 471. *Introduction to Automation and Libraries.* ★3 (Second Term, 3-0-0). To provide an introduction to, and an understanding of, the general field of automation and its implications for libraries.

LIB S 472. *Publishing.* ★3 (either term, 3-0-0). To examine the organized business of writing, manufacturing and marketing books and other media.

LIB S 473. *The Film.* ★3 (either term, 3-0-0). To enable students to select, evaluate and effectively use films in any type of library situation.

LIB S 501. *Comparative Cataloguing.* ★3 (First Term, 3-0-0). To prepare students to specialize in cataloguing or indexing work in either a traditional or computerized library situation. Prerequisite: LIB S 401.

LIB S 502. *Comparative Classification.* ★3 (Second Term, 3-0-0). To prepare students to specialize in classification work in either a traditional or computerized library situation. Prerequisite: LIB S 401.

LIB S 512. *Library Services to Children and Young Adults.* ★3 (Second Term, 3-0-0). To develop a knowledge of the principles and practices of library services to children and young adults. Prerequisite: LIB S 432 or 433.

LIB S 513. *Scientific Communication.* ★3 (First Term, 3-0-0). To look in depth at the literature of science and other means used to communicate scientific information. Prerequisite: LIB S 437.

LIB S 514. *Communications and Libraries.* ★3 (Second Term, 0-3s-0). To examine communications media and assess their relevance to library and information services.

LIB S 521. *Library Buildings.* ★3 (First Term, 3-0-0). To study various types of library building needs, the involvement of librarians and architects in the planning process, and various contemporary building styles. Prerequisite: Either LIB S 441, 442, 444, or 445.

LIB S 522. *Library Systems and Networks.* ★3 (First Term, 3-0-0). To consider models of systems and examples of library cooperation from the simplest to the most sophisticated. Prerequisite: LIB S 421.

LIB S 523. *Records Management.* ★3 (either term, 3-1s-0). To develop an understanding of records management.

LIB S 524. *Personnel Management in Libraries.* ★3 (Second Term, 2-1s-0). To introduce the field of personnel management as an area of critical importance to librarianship. Prerequisite: LIB S 421.

LIB S 531. *Government Publications.* ★3 (First Term, 3-0-0). To examine Canadian government documents and to investigate methods of control and dissemination.

LIB S 532. *Informational Materials for Children and Young Adults.* ★3 (First Term, 3-0-0). To survey information materials that children and young adults use and the ways in which these materials are used. Prerequisite: LIB S 432 or 433.

LIB S 534. *Materials for Learning.* ★3 (Second Term, 3-0-0). To examine the nature of learning materials and the programs in which they are used from the viewpoint of the librarian. Prerequisite: LIB S 432, 433, or 434.

LIB S 542. *School Media Systems.* ★3 (either term, 3-0-0). To examine the organization and administration of school media programs and services at provincial, regional and district levels. Prerequisite: LIB S 445.

LIB S 552. *Bibliography: Historical, Descriptive, Enumerative.* ★3 (First Term, 3-0-0). To introduce the various aspects of the study of "the book" as an object, and its role in contemporary scholarship. Prerequisite: LIB S 452.

LIB S 553. *Contemporary Issues for Librarianship.* ★3 (Second Term, 0-3s-0). To consider new and continuing topics of concern or debate in the library profession and how they influence library attitudes and programs.

LIB S 554. *Comparative Librarianship.* ★3 (Second Term, 3-0-0). To study the international aspects of librarianship and to increase students' understanding of the objectives and potentials of library services.

LIB S 557. *Special Topics in Librarianship.* ★3 (either term, 3-0-0). A current topic or issue significant for librarianship or a special aspect of librarianship, may be examined, as demand and resources permit.

LIB S 563. *Directed Study.* ★3 (either term, 0-3s-0). To assist students in further study of special topics and issues based on knowledge acquired in previous courses or on significant prior experience. Topic to be approved by Faculty.

LIB S 571. *Automation and Libraries.* ★3 (First Term, 3-0-0). To develop students' ability to design, evaluate, and implement typical automated procedures related to library and information centre work. Prerequisite: LIB S 471.

LIB S 900. *Non-Thesis Project.* ★3 (either term, 0-3s-0). For students in the non-thesis route. Topic to be approved by Faculty. Prerequisite: LIB S 462.

THES 000. *Thesis.* Topic to be approved by Faculty. Prerequisite: LIB S 462.

(Left to right) T.A. MacPherson, Assistant Dean; R.S. Fraser, Associate Dean; D.F. Cameron, Dean; L.M. Anholt, Assistant Dean; and F.B. Cookson, Associate Dean

Faculty of Medicine

121 INTRODUCTORY

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R. S. FRASER (Faculty Affairs)

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T. A. McPHERSON (Scientific Affairs)

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W. W. YAKIMETS

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Administrative Officer
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Faculty Service Officer
D. M. GUPTA

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L. D. TE

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E. M. LIBURD

Visiting Assistant Professor
M. JAKOBISIAK

INFECTIOUS DISEASE

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A. R. E. SHAW
A. R. TURNER
P. M. VENNER

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R. A. McTAGGART

Clinical Lecturer
K. PITTOKOPITIS

Clinical Instructor
J. S. ARCHIBALD

Honorary Assistant Clinical Professor
D. TODOSIJCZUK

RHEUMATOLOGY

Professors
J. S. PERCY (Director)
A. S. RUSSELL

Associate Professor
P. DAVIS

Assistant Professor
K. WONG

Clinical Professor
E. G. KIDD

121.1.10 DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

Professor and Chairman
R. P. BECK

Professor
D. L. DUNLOP
D. SCHIFF

Associate Professor
R. T. RICHARDS

Assistant Professors
C. F. HOSKINS
S. KAUFMAN
J. Z. SCOTT

Professor Emeritus
J. R. VANT

Clinical Professors
J. S. BARR
D. M. BELL
L. B. BROWN
J. BUGIS
H. J. CROOKS
R. A. DAY
W. F. FERGUSON
J. MARKO
R. J. OSTOLOSKY
D. W. J. REID

Associate Clinical Professors
J. J. BOYD
S. W. DEVINE
K. W. FINZER
W. D. FREW
F. MORCOS

Assistant Clinical Professors
J. J. BOULTON
J. A. BOYD
D. J. MOYER
T. N. TRAFF
N. W. WEIR
A. WESTGATE
R. W. WINTER

Clinical Lecturers
D. M. BUCHANAN
..G. EVENSON
V. R. GAILIUNAS
..J. GANS
G. IWANIUK
A. JOHNSON
B. KREDENTSER
S. R. LANGTON
D. M. SMITH
H. R. URETSKY

Clinical Instructors
C. E. S. BURNETT
M. LIEBERMAN
P. LUCIEN
G. SABOURIN
D. T. UNGER

Clinical Fellow
D. K. STILL

Sessional Instructor
S. P. FUNG

Honorary Assistant Professor
H. N. FINER

Honorary Clinical Professor
C. H. HORNER

Honorary Associate Clinical Professor
. H. HUSEL

Honorary Assistant Clinical Professor
. C. DAY

Honorary Clinical Instructor
V. SCOTT

121.1.11 DEPARTMENT OF OPHTHALMOLOGY

Professor and Acting Chairman
. T. WYATT

Professors
A. S. BOYD
. G. PEARCE

Instructors
E. BUDD
B. SALTER

Associate Clinical Professors
D. T. R. HASSARD
D. L. REES
H. K. SHUTT

Assistant Clinical Professors
R. A. MORGAN
R. F. SCHINDLER

Clinical Lecturers
J. BUSKI
G. GRANT
F. L. LEONG-SIT
J. RUDNISKY

Honorary Professors
M. G. GRACE
J. K. LAUBER

Honorary Clinical Professor
B. M. MIELKE

Honorary Clinical Lecturer
M. E. PAETKAU

Administrative Officer
M. S. WYETH

121.1.12 DEPARTMENT OF PAEDIATRICS

Professor and Chairman
E. E. McCOY

Professors
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E. W. GAUK
A. B. JONES
R. P. B. LARKE
H. A. PABST
W. C. TAYLOR

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J. GODEL
F. HARLEY
C. M. T. ROBERTSON
A. C. ROUGET
D. W. SPADY

DIVISION OF CARDIOLOGY

Clinical Professor
N. F. DUNCAN (Director)

Associate Professors
R. L. COLLINS-NAKAI
M. PAQUET

DIVISION OF HEMATOLOGY / ONCOLOGY

Associate Professor
J. J. AKABUTU (Director)

Assistant Professor
T. S. GOH

DIVISION OF MEDICAL GENETICS

Professors
P. BOWEN (Director)
E. IVES

DIVISION OF NEONATAL MEDICINE

Professor
D. SCHIFF (Director)

Associate Professors
M. A. BEAUDRY
A. M. CORNET
N. N. FINER
T. F. WARD

Assistant Professor
P. C. ETCHES

Administrative Officer
S. SCOTT

Clinical Professors
H. B. ARMSTRONG
C. T. FRIED
T. A. GANDER
G. W. SELBY
A. STEWART

Associate Clinical Professors
G. J. CONRADI
D. J. HASINOFF
D. R. SHEA
M. TEDESCHINI
J. TKACHYK
O. ULAN

Assistant Clinical Professors
R. CHEN
L. C. GRISDALE
B. A. MALINOWSKI
F. MARTIN
J. J. POPOWICH
E. M. RABINOVITCH
R. WEINBERG
W. T. WU

Clinical Instructors
M. BHAMBHANI
R. DUNDAS
G. ORTEGA
K. WONG

Honorary Associate Professor
K. A. SWALLOW

Honorary Assistant Clinical Professors
P. J. KIMMITT
K. R. MILLER

Honorary Clinical Instructors
J. D. FISCHER
M. JAVORSKI
C. MOISEY
R. OCEJO-MORENO

121.1.13 DEPARTMENT OF PATHOLOGY

Professor and Chairman
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Professors
G. O. BAIN
R. J. SWALLOW

Associate Professors
R. W. M. AMY
R. L. M. HONORÉ
L. D. JEWELL
R. A. STINSON

Assistant Professors
E. S. JOHNSON
L. E. McGANN

Administrative Officer
W. A. HOLMES

DIVISION OF ELECTRON MICROSCOPY

Professor
T. K. SHNITKA (Director)

DIVISION OF FORENSIC, OCCUPATIONAL AND ENVIRONMENTAL PATHOLOGY

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B. W. MIELKE

Associate Professor
R. W. M. AMY

DIVISION OF NEUROPATHOLOGY

Professor
B. W. MIELKE (Director)

Assistant Professor
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Clinical Professors
P. W. DAVEY
S. HANSON
T. A. KASPER
H. W. LETTS
D. G. YOUNG

Associate Clinical Professors
A. DERBAWKA
E. H. SCHLOSS
J. M. TURC

Assistant Clinical Professors
J. M. DANYLUK
P. K. PETRIK
T. Y. THAY
D. J. WILLIANS

Honorary Associate Professor
D. T. P. DAWSON

Honorary Assistant Professors
A. TURNER
G. R. JONES

Lecturers
J. DAKIN
R. G. HODKINSON
L. JACKSON
K. D. VAUGHAN

Honorary Lecturers
J. E. COATES

Professors Emeriti
H. B. COLLIER
J. W. MacGREGOR

DIVISION OF CLINICAL PATHOLOGY AND MEDICAL LABORATORY SCIENCE

Clinical Professors
H. E. BELL (Director)
J. R. HILL
K. WALKER

Associate Clinical Professor
P. A. GORDON (Assistant Director)

Assistant Clinical Professors
A. J. DINWOODIE
J. L. HANNON
M. SALKIE

Honorary Assistant Professor
G. R. JONES

Administrative Officer
SISTER D. RYAN (M.L.S. Coordinator)

Instructors
C. ANDREACHUK
E. BRISSON
M. DINEEN
L. LEITHEAD
P. LETENDRE
S. O'BRIEN
B. OHASHI
W. SIMONSON
M. STARKO
A. WILLIAMS

Honorary Instructor
J. E. COATES

121.1.14 DEPARTMENT OF PHARMACOLOGY

Professor and Acting Chairman
D. A. COOK

Professors
H. P. BAER
W. F. DRYDEN
G. B. FRANK
R. M. HENDERSON

Associate Professors
J. ELBRINK
R. J. REIFFENSTEIN

Assistant Professors
T. M. ALLEN
A. CLANACHAN

Lecturers
E. G. HUNTER
P. A. SMITH

Honorary Professor
A. R. P. PATERSON

Honorary Assistant Professor
K. WONG

121.1.15 DEPARTMENT OF PHYSIOLOGY

Professor and Chairman
M. SCHACHTER

Professors
E. O. HOHN
K. J. HUTCHISON
K. G. PEARSON
R. B. STEIN

Associate Professors
S. C. BARTON
C. I. CHEESEMAN
A. S. FRENCH
S. M. PADSHA
M. POZNANSKY
E. J. SANDERS

Honorary Members
R. L. JONES
C. T. KAPPAGODA
L. W. KLINE
T. NIHEI
R. S. SMITH

Faculty Service Officer
E. KARPINSKI

121.1.16 DEPARTMENT OF PSYCHIATRY

Professor and Chairman
W. G. DEWHURST

Professors
P. HAYS
T. E. WECKOWICZ

Associate Professors
R. C. BLAND
D. R. CAMPBELL
G. HOPKINSON
B. G. HOWARTH
B. K. SINHA
J. W. URSCHEL

Assistant Professors
G. B. BAKER
G. D. WATSON

Clinical Professors
H. F. A. AZIM
P. FLOR-HENRY
J. GUILD
H. WOJCICKI

Associate Clinical Professors
H. M. BARKER
C. A. BLASHKO
R. F. FAIRBAIRN
H. J. FUERST
J. T. GIBBS
G. KING
A. MILLIKEN
G. W. H. NIXON
R. W. NUTTER
D. L. C. PHILLIPS
P. M. SEGAL
L. WARNEKE

Assistant Clinical Professors
M. BLACKMAN
H. E. BREITKREUTZ
A. M. CARROLL
P. E. COPUS
D. R. CORNISH
D. J. GILL
G. J. McINTOSH
P. MILLS
W. F. OTTO
J. H. PASCOE
H. M. PIKTEL
B. S. SANDERMAN
E. SCHWAB
J. B. Van STOLK
D. M. K. W. WILLIAMS

Clinical Instructor
J. B. LEFSRUD

Honorary Professor
R. T. COUTTS

Honorary Associate Professor
B. M. BARKER

Honorary Assistant Professor
A. BENDERLY

Honorary Lecturer
M. KRATOCHVIL

Honorary Associate Clinical Professor
W. H. CRAVER

Honorary Assistant Clinical Professors
D. A. DAVIES
E. J. WIEBE

Honorary Clinical Instructors
B. P. BISHOP
R. H. BOARDMAN
N. LIS
R. LUNDEEN
J. O'KELLY
J. R. PALMER
P. SULLIVAN

Administrative Officer
M. M. FERGUSON

Faculty Service Officer
H. R. McKIM

121.1.17 DEPARTMENT OF RADIOLOGY

Clinical Professor and Chairman
J. D. R. MILLER

DIVISION OF DIAGNOSTIC RADIOLOGY

Clinical Professors
W. E. BEAMISH
B. C. LENTLE (Director of Research)
J. D. R. MILLER (Director)

Associate Clinical Professors
R. W. ARNOLD
W. R. CASTOR
R. M. CLARE
R. CUTHBERT
I. D. HENDIN
P. G. HESLIP
C. E. HOLMES
F. I. JACKSON
R. K. KEOGH
H. J. PHILLIPS
S. A. S. RAO
D. B. RUSSELL
S. C. WINDLE
D. J. ZACKS

Assistant Clinical Professors
M. J. BABIUK
K. CHEUNG
L. G. DUNBAR
H. A. FERRI
D. A. FOSTER
A. M. MacPHERSON
J. T. MASON
F. McCONNELL
I. OATES
E. G. PARKINSON
J. SINGER-JORDAN
G. F. STEVENS

Clinical Lecturers
J. BERNIER
G. CAMUZZINI
A. R. CONRAD
H. J. A. CRANZ
E. J. FITZGERALD
M. FITZGERALD
R. N. LUDWIG
L. L. MALLETT
T. H. SIWAK

Clinical Instructors
G. C. ANDREW
W. H. BEREZOWSKY
K. M. BLAIR
L. BORYS
B. L. CAPLAN
R. G. S. HETT
J. C. HICKERTY
L. A. KOLLER
K. R. KRISTJANSON
W. P. LISTON
E. McMARTIN
R. PETO
O. M. SEMCHISHEN
P. A. SHERIDAN
J. G. E. TURNER

Honorary Professors
T. R. OVERTON
M. G. A. GRACE

Honorary Associate Clinical Professor
Z. GUTTER

Research Associate
W. R. HANSEN

DIVISION OF
RADIATION ONCOLOGY
(Cross Cancer Institute)

Professors
J. G. PEARSON (Director)
G. A. L. GLAZEBROOK
R. C. URTASUN

Associate Professors
P. E. BURNS
D. G. McGOWAN

Assistant Professors
E. M. HIGGINS
A. W. LEES
J. E. PEDERSEN
A. E. STARREVELD

Clinical Professor
J. D. CHAPMAN

Associate Clinical Professor
J. A. RALEIGH

Assistant Clinical Professors
J. J. BATTISTA
A. J. FRANKO
C. KOCH

Honorary Professor
S. R. USISKIN

Honorary Associate Professor
J. W. SCRIMGER

121.1.18 DEPARTMENT OF SURGERY AND CLINICAL SURGERY

Professor and Chairman
H. T. G. WILLIAMS

Administrative Officer
D. M. WHIDDEN

Faculty Service Officer
M. M. CHAMBERS

GENERAL SURGERY

Professors
K. L. BOWES
S. KLING
P. A. SALMON
G. W. SCOTT
O. G. THURSTON
W. W. YAKIMETS

Associate Professor
S. K. KILAM

Assistant Professor
H. L. STEWART

Clinical Professors
J. E. ANSELMO
R. J. BURY
R. J. JOHNSTON
M. M. LASKIN
B. MICHALYSHYN
W. PISESKY
G. L. WILLOX

Assistant Clinical Professors
G. R. BOILEAU
G. F. BONDAR
W. F. M. HALL
H. A. HYDE
A. B. McCARTEN
A. E. THEMAN
E. WIENS

Clinical Lecturers
G. E. ALLIN
R. G. DAVIS
R. E. FRASER
R. M. HACKETT
R. A. HALLGREN
L. J. N. MILLETTE
W. PAWLUK
J. SIEGENBERG
H. J. STOCKBURGER
E. J. TWOREK

Clinical Instructors
D. O. ADAMS
M. BESNEY
A. N. CUTHBERTSON
J. D. FISCHER
M. H. W. FRIEDMAN
M. C. HUNTING
H. L. LINKS
A. W. PROCYSHYN
E. K. SCHMIDT
W. M. STRUCK
K. B. WIANKO

Honorary Assistant Clinical Professor
C. A. ALLARD

Honorary Clinical Lecturer
W. H. GIBSON

BIOCHEMISTRY

Associate Professor
J. C. RUSSELL

EXPERIMENTAL SURGERY

Professors
G. W. SCOTT (Director)
D. C. SECORD

Professor Emeritus
K. P. KOWALEWSKI

Honorary Professor
W. A. G. VOSS

NEUROPHYSIOLOGY

Professor
R. S. SMITH (Director)

Associate Professor
Z. J. KOLES

NEUROSURGERY

Clinical Professors
P. B. R. ALLEN (Director)
B. K. A. WEIR

Clinical Lecturer
W. J. O'CALLAGHAN

Clinical Instructors
T. N. AYERS
J. D. S. McKEAN
K. C. PETRUK

ORTHOPAEDIC SURGERY

Clinical Professor
H. R. HUCKELL (Director)

Associate Professors
.. A. DAVIS
V. M. RIGAL

Assistant Clinical Professors
3. W. CAMERON
. GORT
I. S. HENDERSON
). C. JOHNSTON
. P. MOREAU

Clinical Lecturers
P. R. BOUCHER
D. R. COLTER
B. J. GREENHILL
A. H. McKENZIE
K. J. RUSSELL

Clinical Instructors
H. W. BOUWMAN
R. M. GLASGOW
T. H. GREIDANUS
J. H. HARVEY
K. W. JAMES
J. F. McMILLAN
D. J. MAKAR
M. J. MOREAU
P. G. MOREAU
J. A. ORDMAN
S. SINGH

Honorary Clinical Instructors
G. E. EDWARDS
R. G. TOWNSEND

OTOLARYNGOLOGY

Assistant Clinical Professor
D. J. OLDRING (Director)

Clinical Professor
K. A. C. CLARKE

Assistant Clinical Professor
A. J. LUPIN

Clinical Instructors
A. R. BACKSTROM
O. M. BYKOWSKI
L. T. DIDUCH
J. T. F. KEOHANE
J. A. KOSTIUK
W. H. KUDRYK
G. J. MISKO
M. M. STARKO
S. J. WARSHAWSKI

PLASTIC SURGERY

Clinical Professor
J. D. M. ALTON (Director)

Clinical Lecturers
E. W. BISSELL
T. HAYASHI
H. J. SHIMIZU

Clinical Instructors
D. D. CAMPBELL
G. W. LOBAY
P. VOLOSHIN

THORACIC AND
CARDIOVASCULAR SURGERY

Clinical Professor
J. C. CALLAGHAN (Director)

Assistant Clinical Professor
L. P. STERNS

Clinical Lecturer
E. T. GELFAND

Clinical Instructors
R. L. FORTUNE
S. S. NAKAI

UROLOGICAL SURGERY

Professor
W. H. LAKEY (Director)

Clinical Professor
J. O. METCALFE

Assistant Clinical Professor
R. R. FRANCIS

Clinical Lecturer
M. S. McPHEE

Clinical Instructors
R. C. BOAKE
B. BOCHINSKI
L. M. DUSHINSKI
T. C. EID
F. C. MARSHALL
J. B. METCALFE
L. W. MIX
H. C. RAMAGE
S. M. ROBINSON
M. N. WEISLER

121.2 *General Information*

The Faculty of Medicine of The University of Alberta was established in 1913 and until 1922 conducted a three-year undergraduate medical program in the basic medical sciences.

In 1923 a full program of clinical instruction was begun and the first Doctor of Medicine degrees were awarded in 1925.

The Faculty of Medicine conducts the following programs:

(a) A fully accredited four year program leading to the degree of Doctor of Medicine. At least two pre-medical years at University are required before admission to this program.
(b) A four year program leading to the degree of Bachelor of Science in Medical Laboratory Science, which may be entered at the matriculation level.
(c) A one year program to be taken in conjunction with the M.D. program leading to the degree of Bachelor of Science in Medicine.
(d) A program whereby students in the M.D. Program who fulfill specified requirements may be awarded the Bachelor of Medical Science degree at the conclusion of their second year in the M.D. program.
(e) At the graduate level, programs leading to the degree of Master of Science or Doctor of Philosophy. Also programs leading to the degree of Master of Health Service Administration or the Diploma in Health Service Administration.
(f) Programs leading to eligibility for specialist qualification by the Royal College of Physicians and Surgeons of Canada are offered in co-operation with affiliated hospitals in all clinical specialties.
(g) An extensive program of continuing medical education for physicians practising in Northern Alberta.

Details of each of these programs will be found in § 123, below.

121.3 *Affiliated Hospitals and Institutions*

121.3.1 AFFILIATED HOSPITALS

The primary teaching hospital of the Faculty of Medicine is the University of Alberta Hospital which is located on the university campus.

The University has formal Affiliation Agreements with seven city hospitals: Royal Alexandra Hospital, Edmonton General Hospital, Youville Memorial, Misericordia Hospital, Glenrose Hospital, Charles Camsell Hospital and Cross Cancer Institute. These hospitals actively participate in the undergraduate and graduate teaching programs of the Faculty. The hospitals are represented on the Council of the Faculty of Medicine and the Faculty has a representative on the Governing Board of each hospital.

By special arrangement some undergraduate and graduate training is conducted at the Alberta Hospital, Ponoka, the Alberta Hospital, Edmonton, St. Mary's Hospital, Camrose and the Red Deer General Hospital, Red Deer.

121.3.2 NORTHERN HEALTH SERVICES PROGRAM

Through an affiliation with Medical Services (Northern Region) of the Department of National Health and Welfare a regular rotation of clinical faculty and graduate students to Inuvik and the Arctic coastal areas (Mackenzie Area Ambulatory Program) is maintained. The Mackenzie Area Ambulatory Program covers Cambridge Bay and the surrounding settlements of Gjoahaven, Spence Bay, Pelly Bay, Coppermine, and Holman Island.

121.3.3 THE UNIVERSITY OF ALBERTA FAMILY CLINIC

An ambulatory patient facility, specifically designed for undergraduate and graduate education in family practice is located at both the Royal Alexandra and Misericordia Hospitals. This "Family Clinic" provides medical and other health science students with an opportunity to participate in the provision of comprehensive and continuing health care to a representative section of the community under the supervision of members of their respective faculties.

121.3.4 THE UNIVERSITY OF ALBERTA SURGICAL-MEDICAL RESEARCH INSTITUTE

The University of Alberta Surgical-Medical Research Institute offers facilities for members of the clinical faculty in the field of experimental medicine. Facilities are also available for research fellows in clinical departments to conduct projects under the supervision and direction of the Faculty. The Institute offers a one trimester postgraduate course in experimental surgery.

121.3.5 THE UNIVERSITY OF ALBERTA CANCER RESEARCH INSTITUTE

Established in co-operation with the Canadian Cancer Society and the University, the Unit is housed in the Dr. John S. McEachern Cancer Research Laboratory. It is one of four such units located by the National Cancer Institute in Canadian medical schools. Several postdoctoral research fellowships, for which application may be made to the Director, will be available each year.

121.3.6 THE R. S. McLAUGHLIN EXAMINATION AND RESEARCH CENTRE

The R. S. McLaughlin Examination and Research Centre (R.S.M.) is a division of the Royal College of Physicians and Surgeons of Canada. The R.S.M. specializes in the development of objective examination material designed to meet the requirements of its various clients.

The organizations with which it cooperates in the production of certifying examinations include the Royal College of Physicians and Surgeons of Canada; the Medical Council of Canada; the Corporation Professionnelle des Medecins du Quebec; the Medical

Schools of the Universities of Alberta, Laval, McGill, Montreal, and Sherbrooke. The R.S.M. also assists various clients in the preparation of self-evaluation projects as part of their programs of Continuing Medical Education (C.M.E.).

Besides this service function, the R.S.M. is involved in research into improving methods of evaluating physician competence in the broadest sense — i.e. including assessment of medical knowledge, clinical skills, and interpersonal professional relationships. The R.S.M. conducts an extensive "in house" research program in these areas, as well as encouraging and supporting research in these areas from individuals and institutions across Canada.

The R.S.M. is also actively engaged in developing and evaluating the use of computers in undergraduate and graduate instruction and evaluation.

The Centre is a bilingual organization with its administrative head office in Edmonton, Alberta. It has two divisions or bureaus — one in Edmonton attached to the University of Alberta and the other in Quebec City attached to the University of Laval. The staff consists of medical doctors, psychometricians, programmer analysts, a financial advisor, and a specially qualified secretarial staff.

121.4 Internship and Licensure

Internship. Medical graduates of The University of Alberta will have completed a clinical clerkship (student internship) meeting the requirements of the Federation of Provincial Licensing Authorities. Students graduating in 1975 and subsequently and seeking licensure in Alberta must comply with the requirements of the College of Physicians and Surgeons of Alberta by satisfactorily completing two years of appropriate graduate training.

Internship placement can be arranged through the Canadian Intern Matching Service. Details will be provided to final year students.

Educational Register. While undertaking a student internship, senior medical students are required to be registered on the Educational Register of the College of Physicians and Surgeons of Alberta. This registration provides limited medical practice privileges in the hospital to which the student is assigned for the period of assignment only.

All graduates serving an internship in the Province of Alberta are required, by provincial legislation, to be registered on the Educational Register of the College of Physicians and Surgeons of Alberta. This registration permits the practice of medicine within the hospital designated on the registration. Graduates in residency programs in Alberta who are not licensed registered practitioners in the Province are similarly required to be registered on the Educational Register. Application should be made to the Registrar, College of Physicians and Surgeons of Alberta 9901-108 St., Edmonton, Alberta, T5K 1G9.

Requirements for Licence to Practise. After graduates of The University of Alberta have satisfactorily completed an appropriate period of graduate training as determined by the Provincial Licensing Authority they are entitled to be licensed by the College of Physicians and Surgeons of this province and are eligible for provincial registration. To become licensed in any other province it is necessary to have passed the qualifying examinations of the Medical Council of Canada and to have met the educational requirements of the licensing body of that province.

Medical Council of Canada Examinations. The qualifying examinations of the Medical Council of Canada are conducted at The University of Alberta at times specified by the Council. Students in the fourth year are required to sit for these examinations prior to graduation. A certificate of eligibility from the College of Physicians and Surgeons of Alberta must be presented when making application to sit these examinations.

National Board of Medical Examiners. Students who wish to take the examinations of the National Board of Medical Examiners of the United States may take the Part I and the Part II examinations during their undergraduate program. Part III is taken after completion of graduate internship programs.

Registration for Practice. The holder of a licence to practice must register with the professional organization in the particular province concerned. In Alberta, this is the College of Physicians and Surgeons of the Province of Alberta; for information regarding provincial registration contact the Registrar of the College, 9901 - 108th Street, Edmonton, Alberta, T5K 1G9. Students who intend to practice in any other province should secure information from the provincial body concerned as early as possible in their medical program so that they may know of any special educational conditions which must be fulfilled.

121.5 Finance

Information on fees charged to students in the Faculty of Medicine is given in § 15 of the University Regulations and Information for Students Calendar. In addition, medical students are required to spend approximately $550.00 each year for books, supplies, and instruments. Fourth-year medical students are required to pay an examination fee of $200.00 to the Medical Council of Canada in January of their final year.

Remuneration is presently paid to final year M.D. students by the Department of Health and Social Development of the Government of Alberta.

Details of scholarships and other forms of financial assistance available to medical students will be found in the Awards section of the Calendar, § § 223 to 228.

121.6 Society Memberships

The *Medical Students' Association* is the officially recognized organization of medical students. It provides social, recreational, and cultural activities. It is authorized to collect a membership fee from each student. The Association provides the following annual awards: The Outstanding Teacher Awards are presented to one teacher for excellence as an educator in each of the Phase I, II, and III programs and similarly to one resident. The Shaner Award is presented to a graduating student for exceptional contributions the work of the association.

The *Medical Alumni Association* is an organization of all graduates in Medicine from The University of Alberta. The Association takes an active interest in the Faculty and provides a limited loan fund for undergraduate and graduate students. In addition the Association participates in a number of awards to students and, from time to time, finances specific projects in the Faculty. The Association meets annually in conjunction with the Alberta Medical Association annual meeting.

122.1 Admission

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including a full introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by the University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by the University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; *or*

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division of the Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

122.1.1 M.D. PROGRAM

(1) *Academic requirement.* The basic academic requirement for admission to the M.D. program is the satisfactory completion, after senior matriculation, of at least two years of university work approved by the Faculty of Medicine, including full courses in Organic and Inorganic Chemistry, English, Physics, and Biology together with courses in Psychology, Mathematics and Statistics, Microbiology, Genetics and Zoology. This requirement can be met in varying degree patterns within the Faculty of Science. The required courses comprise at least 8½ of the 10 courses of a two year program and they form the basis upon which the scholastic level for admission to the M.D. program will be assessed. Students intending to fulfill these requirements at The University of Alberta within the minimum (two year) period must complete:

Year 1:
Chemistry 200 or 202 or 250
English 210 (or other 6 credit English course)
Physics 212 or 205/207, or 205/209, or equivalent for applicants who have credit in Physics 30. Physics 203/207 or 203/209 or equivalent for applicants without Physics 30
Biology 296
One of Biology 297, 298 or 299
Psychology 260
One of Mathematics 202, 203 or equivalent

Year 2:
Chemistry 302 (if Chemistry 250 was taken during the first year) or Chemistry 350 (if Chemistry 200 or 202 was taken during the first year)
Genetics 351 or alternatively Biology 297 and Genetics 375. (If Biology 297 was included in the first year program, a half-year option in Arts or Science may be taken.)
Zoology 325
Microbiology 315
Psychology 261
Statistics 241
An Arts option which may be a full year course or two half year courses.

Students embarking upon premedical programs of longer duration should ensure that the above prerequisites are completed and that each year in which they are included comprises a minimum of five full course equivalents.

NOTE: Applicants who entered university prior to the 1976-77 session or who are applying for admission from other universities or colleges in Alberta or elsewhere will be considered on the basis of previously required prerequisites, that is, a minimum of 2 years of university work approved by the Faculty of Medicine, including full university courses in Organic Chemistry, Inorganic Chemistry, Physics and Zoology (or Biology). It would be to the advantage of such students to conform to the stated requirements as far as possible as the first year of the M.D. program is structured on the assumption that all of the required material has been covered and there will neither be time nor opportunity within that year to make up deficiencies. Students applying with programs other than those detailed above will be considered as a special group.

(2) *Scholastic standing.* Consideration for admission will be given only to students who have obtained an over-all average of at least 6.5 in the work of preceding university years.

(3) *Personal requirements.* While admission to the M.D. program is granted mainly on the basis of academic standing, the lack of essential personal qualities in an applicant may be deemed sufficient cause for refusal of admission.

Age is a consideration for admission to the Faculty. Students who will be 28 years of age or older at the time of application for admission are advised to consult with the Admissions Officer before starting pre-medical studies.

(4) *Residence requirement.* Priority for admission is given to students who are Canadian citizens or Permanent Residents (Landed Immigrants) and who complete their entrance requirements at a university in Alberta, and to students from Alberta in attendance at other universities. A limited number of places may be made available to applicants who do not fill these requirements.

(5) *Medical College Admission Test.* All applicants are required to take the New Medical College Admission Test. This test is conducted in Edmonton by the Examinations and Timetabling Division of the Registrar's Office in the spring and fall of each year. An application to take this test, together with a fee of $40.00 (U.S.) must be sent directly to the American College Testing Program, P.O. Box 414, Iowa City, Iowa 52240, U.S.A. four weeks before the date of the test. Details and application forms may be obtained from the Office of the Dean of Medicine or from the Examinations and Timetabling Division, Rm. 123, Administration Building.

(6) *Application deadlines.* Students should make application for admission to the Registrar by November 1 of the year prior to that for which admission is sought. Later applications cannot be accepted.

(7) *Physical examination.* Students admitted to the M.D. program are required to present a certificate of medical examination from a physician of The University Health Services as part of the Faculty requirements.

(8) *Interview.* Applicants may be required to present themselves for a personal interview at the discretion of the Admissions Committee.

(9) *Deposit.* Applicants will be advised of the decision of the Admissions Committee in late June. Successful applicants, upon acceptance of a place in the first-year class, are required to make a deposit of $50.00 to the Comptroller of The University of Alberta. This deposit will be applied on tuition fees when the student registers. Should a candidate withdraw after once accepting a position this deposit will be forfeited.

(10) Applicants are reminded of the regulations set out in § 13.1.2 of the University Regulations and Information for Students Calendar.

122.1.2 B.SC. PROGRAM IN MEDICAL LABORATORY SCIENCE

The Matriculation requirements for admission to the B.Sc. program in Medical Laboratory Science are set out in § § 13.1 and 13.12.2 of the University Regulations and Information for Students Calendar.

NOTE A: Each student is required to have a personal interview or submit acceptable references before the application can be considered complete. Satisfactory personality, communication skills and health are considered.

NOTE B: Limited space is available for transfer into the second year of the program from other faculties at The University of Alberta.

NOTE C: Prospective students holding a current registration with the Canadian Society of Laboratory Technologists may be given advanced credit. Further information may be obtained from the Division of Medical Laboratory Science, Clinical Sciences Building, University of Alberta.

NOTE D: **MEDICAL LABORATORY SCIENCE IS NOT RECOMMENDED AS A PRE-MED PROGRAM. SEE PRE-PROFESSIONAL PROGRAM LISTED IN THE SCIENCE CALENDAR § 183.26.**

122.2 Academic Standings and Graduation

122.2.1 M.D. PROGRAM

(1) The Council of the Faculty of Medicine approves the principle that the means of assessing a student's progress and determining the student's grades may vary from one department to another in accordance with the nature of the course. Factors other than examination results may be used to a variable extent by instructors in determining grades but students will be informed at the commencement of the course how grades are to be determined.

(2) The Council of the Faculty of Medicine has established a Student Evaluation Board, consisting of ten faculty members and four students, responsible for all student evaluation procedures and for the co-ordination of examinations.

(3) Students are advised each year of the procedures to be used in their evaluation, the determination and reporting of their grades and the standards required by the Faculty. Students are also advised of the procedures for appeal established within the Faculty and the University.

(4) Each student is awarded a grade point average at the conclusion of each phase of the program on the basis of his or her performance in course examinations held during the phase and on a final comprehensive examination.

(5) A student with a grade point average of less than 5.0 will not be permitted to proceed in the M.D. program except at the discretion of the Faculty.

(6) Supplemental privileges, when awarded, normally apply to the full comprehensive examination, and satisfactory completion of a remedial program may be required before taking the examination.

(7) A student granted supplemental examination privileges will be expected to show marked improvement over previous performance and to obtain a grade point average of at least 5.5.

(8) A student neglecting to take a supplemental examination will not be allowed to continue in Medicine.

(9) No student will be allowed to proceed to any subsequent year of the medical program unless he or she has completed all the work of the previous year.

(10) No student will be allowed to repeat the first year of the medical program except in special circumstances approved by the Faculty.

(11) A student permitted to repeat a failed year who fails to obtain a satisfactory record in the First Term in that year will be required to withdraw from the Faculty.

(12) Except in very unusual circumstances, a student who is repeating a year will be required to withdraw unless he or she obtains a grade-point average of at least 5.5 in the work of the repeated year.

(13) Any student whose work, or performance, is deemed unsatisfactory will be required to withdraw from the Faculty of Medicine.

(14) A student whose performance during the student internship is deemed to be unsatisfactory will be required to satisfactorily complete a remedial period of training in that discipline or may be required to withdraw from the Faculty.

122.2.2 B.SC. PROGRAM IN MEDICAL LABORATORY SCIENCE

(1) Promotion in the Medical Laboratory Science program is dependent on satisfactory completion of all work of the previous year with a minimum grade point average of 5.0 as well as the following requirements:

First year: A student must obtain a minimum average of 5.0 in the combined grades for CHEM 200 and 250.

Second Year: A student must obtain a minimum grade of 5.0 in each of BACT 361, CL PA 367 and CLBIO 369.

Third Year: A student must obtain a minimum grade of 5.0 in PATH 400.

Fourth Year: A student must obtain a minimum grade of 5.0 in PATH 401 and one of PATH 508, 509 or BACT 510.

(2) Supplemental examination privileges may be granted at the discretion of the Faculty Revisions Committee.

(3) Students are required to take a minimum of twelve (12) credits in science courses at the 400 level or higher in the fourth year of the program.

123 PROGRAMS OF STUDY

123.1 The Degree of M.D.

123.1.1 GENERAL INFORMATION

The four year program leading to the M.D. degree is conducted in three Phases, each under the direction of an interdepartmental Faculty Committee.

Phase I. A one year (33 week) program in the basic medical sciences with an introduction to clinical medicine. Co-ordinator: Dr. J. Elbrink.

Phase II. A one year (33 week) program in clinical and related basic medical sciences taught in a body system format in the context of the mechanisms of human disease. Co-ordinator: Dr. B. J. Sproule.

Phase III. The final two years is a continuous program which includes a student internship of not less than 52 weeks and an elective program of approximately 22 weeks which each student develops individually.

A wide range of elective programs in all aspects of medical science, medical practice and related areas is available.

To conform with University procedures and to facilitate applications for financial assistance, students entering fourth year will be required to re-register by July 1st prior to undertaking the final year of the program.

During Phase III each student is entitled to a four week holiday period. Co-ordinator: Dr. W. W. Yakimets

123.1.2 PHASE I (FIRST YEAR)

	Hours
ANAT 411 (Preclinical Anatomy)	276
ANAT 413 (Human Cytology, Histology and Organology)	144
BACT 411 (Medical Microbiology)	80
BIOCH 411 (General Biochemistry)	133
CO ME 411 (Community Medicine)	20
MED 411 (Clinical skills)	54
PATH 411 (General Pathology)	30
PMCOL 411 (Principles of Pharmacology)	74
PHYSL 411 (Human Physiology)	139

123.1.3 PHASE II (SECOND YEAR)

	Hours
CO ME 421 (Community Medicine)	12
MED 421 (Mechanisms of Disease)	
Medically oriented subjects.	
(a) Electrolyte Balance	8
(b) Clinical Skills	22
(c) Cardiovascular System	78
(d) Endocrinology and Metabolism	54
(e) Gastrointestinal System	70
(f) Genetics	14
(g) Hematology	62
(h) Immunology	16
(i) Infectious Disease	72
(j) Nephrology	44
(k) Oncology	20
(l) Pulmonary	60
(m) Rheumatology	24
Surgically oriented subjects	
(n) Otolaryngology	4
(o) Ophthalmology	28
(p) Supplementary Surgery	90
(q) Urology	44
NEURO 421 (Neurological Sciences)	105
PATH 421 (Pathology)	68
PMCOL 421 (Pharmacology)	52
PSYCI 421 (Introduction to Psychiatry)	30

123.1.4 PHASE III (THIRD AND FOURTH YEAR)

	Hours
OB GY 431	80
SURG 431 (Orthopaedics)	56
PATH 441	15
CO ME 431	20
MED 441	125
MED 442	58
	Weeks
MED 446 (Student Internship)	16
OB GY 446 (Student Internship)	8
PAED 446 (Student Internship)	8
PSYCI 446 (Student Internship)	8
SURG 446 (Student Internship)	12
Electives	22

123.2 The Degree of B.Sc. in Medical Laboratory Science

123.2.1 GENERAL INFORMATION

The Faculty of Medicine conducts a four-year program in Medical Laboratory Science, intended to qualify selected applicants for a career as laboratory supervisors or senior technologists in hospitals or medical science laboratories. The first, second, and fourth years of the program are regular university years. The third year, beginning approximately May 1, consists of a twelve month period of practical laboratory training under the direct supervision of the Faculty of Medicine. Students will receive some remuneration from The University of Alberta Hospital during the third year of the program. At the end of this year, they are eligible to take the examinations of the Canadian Society of Laboratory Technologists.

NOTE: Because individuals working in hospital laboratories run some risk of infection from materials which they will be handling, all students in the Medical Laboratory Science program must take a series of immunizations approved by the office of the Dean of Medicine before beginning the second year.

123.2.2 PROGRAM OF COURSES

First Year	*First Term Hours*	*Second Term Hours*
CHEM 200 (Chemistry)	3-1s-3	3-1s-3
CHEM 250 (Organic Chemistry)	3-0-3	3-0-3
BIOL 297 (Heredity)	3-0-3or	3-0-3
PHYSL 261 (Elementary Physiology)	3-0-0	3-0-3
MICRB 315 (General Microbiology I)	3-0-3	—
PATH 291 (Introduction to Laboratory Medicine)	—	3-0-2
An Approved Option	3-0-0	3-0-0

Second Year		
BACT 361 (Pathogenic Bacteriology)	3-0-3	3-0-3
CL PA 367 (Hematology)	3-0-6	3-0-6
CLBIO 369 (Clinical Biochemistry)	3-0-3	3-0-3
PATH 231 (Introduction to Histopathology)	3-0-3	—
An Approved Science Option*	—	3-0-3
An Approved Option	3-0-0	3-0-0
Third Year		
BIOCH 300 (General Biochemistry)	3-0-3	3-0-3
PATH 400 (Medical Laboratory Science I) (See Note A)	—	—
Fourth Year		
PATH 401 (Medical Laboratory Science II)	3-0-6	3-0-6
One of PATH 508, PATH 509 or BACT 510 (Special Project)	0-0-3	0-0-3
An approved Science option* (See Note B)	3-0-0	3-0-0
An approved Science option*	3-0-0	3-0-0
An approved Arts option (See Note C)	3-0-0	3-0-0

*A list of approved Science options will be made available to students prior to registration.

NOTE A: PATH 400 (Hospital practice). Students will be assigned to hospital laboratories approved for this purpose by the Council of the Faculty of Medicine.

NOTE B: One of the approved Science options must be a course which requires laboratory sessions.

NOTE C: Fourth year students are required to take twelve (12) credits at the 400 level or higher in approved Sciences.

123.3 The Degree of B.Sc. in Medicine

A one-year program of study in a branch of medical science leading to the degree of Bachelor of Science in Medicine may be undertaken either at the completion of the second year of the medical program or following the degree of M.D. The work for this degree may be carried out in any department of the Faculty of Medicine, but may not be taken concurrently with any part of the medical curriculum nor by a student carrying any condition in his/her medical program.

123.4 The Degree of Bachelor of Medical Science

The degree of Bachelor of Medical Science may be awarded to students in the M.D. program at the end of the second year of that program who have fulfilled the following requirements at this or another University:

First Year
Two Science Courses
Three Arts or Science Courses

Second Year
Two Science Courses
Three Arts or Science Courses

Third Year
First year (Phase I) M.D. Program

Fourth Year
Second year (Phase II) M.D. Program

Provided that:

(a) None of the courses presented have been used for credit toward another degree.

(b) The program does not include more than seven junior arts or science courses.

(c) The science courses include:

(i) Chemistry 200 or 202 or equivalent,

(ii) Chemistry 250 or 350 or equivalent,

(iii) Two of Biology 296, 297, 298 or 299 or equivalent,

(iv) Physics 212 or 205/207, or 205/209, or equivalent for applicants who have credit in Physics 30. Physics 203/207 or 203/209, or equivalent for applicants without Physics 30.

(d) The Science options do not include first courses in biochemistry or physiology.

(e) At least the final two years have been taken at The University of Alberta.

(f) A grade-point of 4.0 or better in all courses and a Grade Point Average in each year of at least 5.0 or equivalent is presented.

(g) Not more than two supplemental examinations have been written for the purpose of obtaining passing marks or raising the Grade Point Average to the required 5.0.

123.5 Graduate Study

123.5.1 THE DEGREES OF M.SC. AND PH.D.

Programs leading to the degree of Master of Science or Doctor of Philosophy in any of the basic medical sciences, in medicine, surgery, ophthalmology, paediatrics and radiology are conducted under the auspices of the Faculty of Graduate Studies and Research. There is also an interdisciplinary Ph.D. program in the medical sciences offered cooperatively by the departments of Immunology, Medical Bacteriology, Medicine, Pathology, Paediatrics and Psychiatry. These programs are open to graduates in Medicine or to holders of an acceptable B.A. or B.Sc. degree who can meet the requirements of the Faculty of Graduate Studies and Research.

For further information, see the Faculty of Graduate Studies and Research Calendar.

123.5.2 THE DEGREE OF MASTER OF HEALTH SERVICES ADMINISTRATION

The Division of Health Services Administration, under the direction of the Faculty of Graduate Studies and Research, offers a two-year program leading to the degree Master of Health Services Administration. The student may select either a thesis or a non-thesis route to the degree.

The thesis option emphasizes the development of research and planning expertise relevant to efficient and effective health and social services delivery. The non-thesis option emphasizes the development of administrative expertise relevant to service programs and agencies in the health and welfare fields.

The details of a student's course requirements are determined by the faculty of the Division and consideration is given to the student's prior background of course work and experience as well as his/her career plans. Each student is expected to develop an area of special interest such as hospitals, nursing service, social welfare, medical care, epidemiology, and so on. Within this framework, the normal Qualifying Year course requirements are as follows:

WINTER SESSION

First Term

H S A 400 Health and Welfare Delivery Systems
H S A 420 Structure and Process in Health and Welfare Service Agencies

H S A 430 Methods and Statistics in Health Services Administration: I

Two of:

H S A 435 Survey of Epidemiology
H S A 450 Health Services Accounting
H S A 470 Introductory Health Care Economics

Second Term

H S A 401 Problems and Issues in Health and Welfare Delivery
H S A 431 Methods and Statistics in Health Services Administration: II

One of:

H S A 421 Management of Health and Welfare Service Agencies
H S A 513 Nursing Service Administration*

Two of:

H S A 451 Application of Managerial Accounting to Health Service Agencies
H S A 471 Application of Economic Principles Health Services Administration
H S A 535 Problems and Issues in Epidemiology

MAY-AUGUST SUMMER PERIOD

H S A 499 Field Practicum (four months)

*Alternative courses in mental health services administration, occupational health, home care administration, public health administration, and so on, may be available in any given year, depending on student interest and available faculty resources.

In the Candidacy Year, students in the non-thesis option must complete H S A 900, 600, 601, and six additional half-year courses, or equivalent; thesis option students must complete four to six half-year courses, or equivalent, depending on the scope of the thesis. Normally *all* students must complete at least two of the following pairs of Candidacy Year courses: H S A 530-531, H S A 550-551, H S A 560-561, H S A 570-571.

Consideration may be given to major modifications in the course work outlined above in exceptional circumstances of prior education, work experience, and career interest.

The MHSA program is acceptable to the Council of the Royal College of Physicians and Surgeons of Canada as a portion of the specialty training program in Community Medicine.

Requests for further information should be forwarded to the Director, Division of Health Services Administration, The University of Alberta, 13-103 Clinical Sciences Building, Edmonton, Alberta. T6G 2G3.

Requirements of Admission

(1) A baccalaureate degree with a grade point average of at least 6.0 in the work of the last two undergraduate years at The University of Alberta, or an equivalent qualification from another institution;

(2) Submission of the results of a Miller Analogies Test;

(3) A statement from the Director of the Division of Health Services Administration (following review of the application) that the applicant is, in all respects, acceptable to the Department.

NOTE: Further information may be obtained from the Director, Division of Health Services Administration, Faculty of Medicine.

123.5.3 THE DIPLOMA IN HEALTH SERVICES ADMINISTRATION

The Division of Health Services Administration offers a post-graduate Diploma in Health Services Administration.

The purpose of the diploma is to provide post-baccalaureate educational experience in health services administration to a larger number of health care personnel than is currently possible within the framework of the Master's program in Health Services Administration at The University of Alberta. This program will be of particular interest to health and welfare executives seeking mid-career educational opportunities.

The following policy will govern operation of the Diploma program:

(1) In order to be admissable to the program, the applicant must have had three years' experience in an administrative, clinical, or research position in the health or welfare field and must meet all other Faculty of Graduate Studies and Research standards, namely:

(a) a baccalaureate degree with a grade point average of at least 6 in the work of the last two years;

(b) a statement from the director of the Division that the applicant is in all respects acceptable as a student; and

(c) English language proficiency (for all non-Canadians for whom English is not the major language).

(2) The diploma may be completed on a full-time or part-time basis but must be finished within 4 academic years of initial registration: it can be completed in one full-time academic year. Normally, only courses taken within the five years prior to registration may be considered for exemption from the diploma course requirements: no more than two exemptions will normally be allowed.

(3) The course requirements will be:

H S A 400 Health and Welfare Delivery Systems
H S A 401 Problems and Issues in Health and Welfare Delivery
H S A 420 Structure and Process in Health and Welfare Service Agencies

One of:

H S A 421 Management of Health and Welfare Service Agencies
H S A 513 Nursing Service Administration

Four of:

H S A 430 Methods and Statistics in Health Services Administration: I
H S A 431 Methods and Statistics in Health Services Administration: II
H S A 450 Health Services Accounting
H S A 451 Application of Managerial Accounting to Health Service Agencies
H S A 470 Introductory Health Care Economics
H S A 471 Application of Economic Principles to Health Services Administration

Plus: Two approved electives, which will be either advanced (candidacy year) courses in health services administration or other courses outside the Division which are deemed to be centrally relevant to the career interests and needs of the student because of the specialized knowledge which they provide.

(4) Grade requirements for graduation will be the same as those for a Master's degree at The University of Alberta, that is, a grade point average of 6, or better.

(5) Procedures for admission, student review and student discipline will be the responsibility of a Committee of the whole of the full-time Health Services Administration faculty, as it is for Master's students.

NOTE: Further information may be obtained from the Director, Division of Health Services Administration, Faculty of Medicine.

123.5.4 COMBINED M.D. PH.D. PROGRAM

A Medical Scientist Program is available for highly qualified students strongly motivated toward a career in medical sciences. It will require seven years of study (after admission to the Faculty of Medicine) and will lead to the acquisition of both an M.D. and a Ph.D. degree. The program is designed to equip its graduates to pursue a career of teaching and research either in

one of the basic medical sciences or in clinical medicine. The mechanism by which the combined program may be completed is outlined below.

A student may, after completion of two years of the medical program, withdraw from that program and apply for admission to the Faculty of Graduate Studies and Research. If acceptable to the appropriate basic science department and to the Faculty of Graduate Studies and Research, the student would embark upon a program leading to the Ph.D. degree. The time required for the completion of the requirements for the Ph.D. degree would depend upon the previous training of the applicant, and would be normally three years in the case of a student who had entered the Faculty of Medicine holding a B.Sc. degree, and four years in the case of a student who entered the Faculty of Medicine from a two-year pre-medical program. Upon completion of the Ph.D. program, the student could re-enter the Faculty of Medicine and complete the requirements for the M.D. degree.

123.5.5 GRADUATE TRAINING IN MEDICAL AND SURGICAL SPECIALTIES

Graduate training programs fulfilling requirements laid down by the Royal College of Physicians and Surgeons of Canada are offered in the following specialties: Anaesthesia, General Surgery, Internal Medicine (and its subspecialties), Laboratory Medicine (Anatomical Pathology, General Pathology, Haematological Pathology, Medical Biochemistry and Medical Microbiology, Nuclear Medicine, Neurology, Neurosurgery, Obstetrics and Gynaecology, Ophthalmology, Orthopaedic Surgery, Otolaryngology, Paediatrics, Physical Medicine and Rehabilitation, Plastic Surgery, Psychiatry, Radiology (Diagnostic), Radiation Oncology, Thoracic and Cardiovascular Surgery and Urology.

In addition, two-year periods of graduate training for certification by the College of Family Physicians Physicians are available under the auspices of the Division of Family Medicine.

In all specialties, the graduate program takes the form of successive residency and sometimes research appointments with increasing responsibility during which seminars and directed reading programs are conducted covering the scope of the specialty. All individuals accepted for specialty programs and including rotating interns are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

Programs are open to suitably qualified graduates who are eligible to have their names placed on the Educational Register of the College of Physicians and Surgeons of Alberta. Commencing 1 January 1981 all foreign medical graduates will be required to have passed the new Evaluating Examination of the Medical Council of Canada to be eligible for registration with the College.

Inquiries regarding these programs should be directed to the Director, Division of Postgraduate Medical Education, Clinical Sciences Building, The University of Alberta.

123.6 Continuing Medical Education

The objective of the Division of Continuing Medical Education is to provide the practicing physician with the opportunity to remain up-to-date in knowledge, skills and attitudes of the practice of Medicine. The Division organizes a variety of post graduate learning events for family practitioners and specialists. These include Regional Conferences in outlying hospitals of Central and Northern Alberta, major university based courses, and clinical externship programs in the teaching hospitals of Edmonton for individual physicians. The Division co-sponsors teaching events with a variety of para-medical organizations and organizes some joint events with medical and para-medical registrants. The Division enjoys the support of the College of Family Physicians of Alberta and the Alberta Medical Association.

124 DETAILS OF COURSES

124.1 General Information

In the following sections, courses offered by the various departments of the Faculty are listed in alphabetical order.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★", standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. Some courses are offered for credit only and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week or in some cases the total time in the term. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The hours of instruction are the same in both terms unless otherwise indicated. If the course lasts only one term, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

124.2 Anaesthesia

124.2.1 UNDERGRADUATE COURSES

Instruction in Theoretical aspects of Anaesthesic practice is included in Pharmacology 421.

124.2.2. ELECTIVES

ANAES 447. ★0 (4 weeks). Supervised clinical experience in anaesthesia and management of the unconscious patient in affiliated hospitals for students in Phase III only.

124.2.3 GRADUATE TRAINING

A complete residency program in Anaesthesia is offered by the Department of Anaesthesia and affiliated hospitals. It comprises two years approved training in clinical anaesthesia, a year for neonatal and adult intensive care as well as cardiopulmonary medicine, and a year doing research, additional clinical anaesthesia, or an alternative acceptable to the Royal College. In the course of this program which covers a minimum of four years, residents pass through:

	Weeks
ANAES 541 First Year Anaesthesia	52
ANAES 542 Second Year Anaesthesia	52
ANAES 543 Third Year Anaesthesia	52
ANAES 544 Fourth Year Anaesthesia	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.3 Anatomy

124.3.1 UNDERGRADUATE COURSES

ANAT 300. *Human Morphology.* ★3 (Second Term, 3-0-0). An overview of human structure. Emphasis is placed on the systems of the body and their co-operative role in normal function. A lecture course open to Pharmacy students only.

ANAT 411. *Preclinical Anatomy.* ★6 (276 hours). A survey of the human body including its development, from a medical point of view, through the media of participation in laboratory work using modern equipment and original techniques and television demonstrations. Designed to enable the student to acquire a sound knowledge of basic anatomy as required in the clinical years and to develop a concept of the total body. Prerequisite: A University level biology or zoology course and consent of the Department.

ANAT 412. *General Anatomy.* ★5 (First Term, 105 hours). Gross anatomy of the body in general and of the head and neck in detail, with emphasis on clinical dental practice. This course is open only to dental students.

ANAT 413. *Human Cytology, Histology, and Organology.* ★6 (144 hours). The minute structure of all cells, tissues, and organs of the human body. Laboratory work with tutorial assistance allows for group learning and self-teaching. Prerequisite: A University level biology or zoology course and consent of the Department.

ANAT 417. *Microscopic Anatomy.* ★3 (First Term, 60 hours). The microscopic features of cells, tissues and organs of the human body to provide a comprehensive knowledge in the basics of general human histology. This course is open only to dental students.

ANAT 419. ★2 (Second Term, 30 hours). A basic course in the main structural and functional aspects of the central nervous system, with emphasis on the practical importance of neurological science rather than theoretical concepts. This course is open only to dental students.

NEURO 421. *Neurological Sciences.* ★5 (2-0-2). An integrated course in neuroanatomy, neuropathology, neuroradiology, neuropharmacology, neurology, and neurosurgery. Instructors: members of the Departments of Anatomy, Neurology, Neuroradiology, Neurosurgery, Pharmacology, and Pathology.

124.3.2 ELECTIVES

ANAT 447. ★0(4 weeks). Elective program in Anatomy only for students in Phase III.

124.3.3 GRADUATE COURSES

ANAT 601. *Histology and Cytology.* ★6 (2-0-4).

ANAT 602. *Developmental Anatomy.* ★3 (First Term, 2-0-4).

ANAT 604. *Advanced Neuroanatomy.* ★6 (2-0-2).

ANAT 605. *Gross Anatomy.* ★6 (2-0-4).

124.4 Medical Bacteriology

124.4.1 UNDERGRADUATE COURSES

BACT 230. *Introductory Medical Microbiology.* ★3 (Second Term, 2-0-2). Microbiology with special reference to aspects of importance in the medical field. The laboratory sessions cover important techniques specifically designed for first year students in the M.L.S. program.

BACT 231. *Medical Microbiology.* ★3 (either term, 2-0-3). Microbiology course dealing with the nature, characteristics, and activities of micro-organisms and their relationship to health and disease. Designed primarily for students in R.N. Program. The course is a half-year course offered both terms.

BACT 233. *Medical Microbiology.* ★3 (Second Term, 2-0-3). General microbiology course dealing with micro-organisms, their nature, distribution and role in disease. Particular emphasis is placed on epidemiology of infection, responsibilities with hospitals and prevention and control of infection. Course designed for students in B.Sc. Nursing, Premedical and others interested in medical microbiology.

BACT 304. *Bacteriology.* ★4 (Second Term, 3-0-3). An introduction to general bacteriology, aspects of infection and resistance, selected examples of infectious disease. Special bacteriology of the mouth including dental caries and peridontal disease. Course designed for dental hygiene students.

BACT 361. *Pathogenic Bacteriology.* ★6 (3-0-3). The role of bacteria, viruses and fungi in disease. Introductory consideration of mechanisms of microbial pathogenicity and human resistance. Particular emphasis is placed on diagnostic procedures. Prerequisite: BACT 230 or MICRB 315. Open to students in Medical Laboratory Science and to others with consent of the Department.

BACT 411. *Medical Microbiology.* ★4 (80 hrs). An introductory course for medical students illustrating principles of microbiology by examples drawn from the medical field. Introduction to principles of host-parasite interaction. Available to first year medical students.

BACT 422. *Bacteriology.* ★3 (First Term, 40 hours). General microbiology with an introduction to morphology, physiology and genetics of micro-organisms and a consideration of fundamental aspects of infection and resistance. A study of the most common infectious diseases with emphasis on infections of the mouth including dental caries and peridontal disease. Course specifically designed for dentistry students.

BACT 425. *Medical Virology.* ★3 (Second Term, 1-0-5). A detailed examination of the principles underlying the identification of viruses of medical importance. Strong emphasis will be placed upon the practical application and rationale of viral diagnostic methods. Prerequisites: MICRB 424 and consent of the Department of Medical Bacteriology.

BACT 426. *Medical Parasitology.* ★3 (First Term, 3-0-3). A survey of the protozoan and metazoan parasites of man. Emphasis will be placed on laboratory methods for detection and identification as an aid to diagnosis and therapy. Prerequisite: A course in medical bacteriology or consent of the Department.

124.4.2 ELECTIVES

BACT 447. ★0 (4 weeks). Elective program in medical bacteriology offered only for medical students in Phase III.

124.4.3 GRADUATE COURSES

BACT 501. *Microbiology Literature Review.* ★3 (either term 3-0-0). A supervised course dealing with current ideas in microbiology. Students attend discussion sessions in the Department and prepare seminars.

BACT 504. *Medical Mycology.* ★3 (First Term, 1-0-3). Laboratory study of the fungi which cause disease in man. Methods for the demonstration, isolation and identification of pathogenic fungi. Some attention will also be given to the

epidemiology, serology and pathology of fungus diseases. Prerequisite: A course in medical bacteriology.

BACT 505. *Mechanisms of Pathogenicity.* ★3 (First Term, 3-0-3). A functional approach to the production of disease by microbes emphasizing biochemical, immunological and physiological properties of host and microbe which account for a pathological process. Prerequisites: Introductory bacteriology or microbiology and biochemistry or consent of the Department.

BACT 506. *Topics in Advanced Diagnostic Microbiology.* ★3 (Second Term, 2-0-4). Designed for advanced undergraduate and graduate students in Science and in Medicine. New approaches and problem handling in diagnostic microbiology. Examples used will be the organisms of the genital tract with emphasis on agents of sexually transmitted diseases. Prerequisites: BACT 361 or MICRB 365 and the consent of the Department.

BACT 508. *Special Projects.* ★3 (either term, 0-0-3).

BACT 509. *Special Projects.* ★3 (either term, 0-0-3).

BACT 510. *Special Projects.* ★3 (either term, 0-0-3).

BACT 511. *Special Projects.* ★3 (either term, 0-0-3).

BACT 512. *Special Projects.* ★3 (either term, 0-0-3).

BACT 530. *Biological Techniques in Electron Microscopy.* ★3 (either term, 1-0-5). Biological techniques in electron microscopy with special emphasis on those which apply to medical microbiology. The course will include theory and use of the electron microscope, preparation of microbiological and biological material for examination by electron microscopy using various basic techniques, photography and other related topics. Prerequisite: A university course in basic biology or microbiology and consent of the Department of Medical Bacteriology.

BACT 531. *Advanced Biological Techniques in Electron Microscopy.* ★3 (either term, 1-0-5). Advanced biological techniques in electron microscopy with special emphasis on those which apply to medical microbiology. The course will include an extension of techniques covered in Bacteriology 530 and will include more advanced techniques of specimen preparation and use of the electron microscope. Prerequisite: BACT 530 (or adequate previous experience in electron microscopy of biological materials) and consent of the Department of Medical Bacteriology.

124.4.4 GRADUATE TRAINING

A complete residency program leading to fulfillment of specialist training requirements in Medical Microbiology is offered by the Department of Medical Bacteriology. In the course of the four-year program, residents pass through:

	Weeks
BACT 541 First Year Medical Bacteriology	52
BACT 542 Second Year Medical Bacteriology	52
BACT 543 Third Year Medical Bacteriology	52
BACT 544 Fourth Year Medical Bacteriology	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.5 Biochemistry

124.5.1 UNDERGRADUATE COURSES

BIOCH 300. *General Biochemistry.* ★6 (3-0-3). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and 250 or 350.

BIOCH 411. *General Biochemistry.* ★6 (133 hours). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and 250.

124.5.2 ELECTIVES

BIOCH 447. ★0 (4 weeks). Elective program in biochemistry offered only for students in Phase III.

124.5.3 GRADUATE COURSES

BIOCH 501. *Advanced Laboratory.* ★6 (0-0-8).

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). Microbiology. Offered in alternate years.

BIOCH 511. *Enzymology.* ★3 (First Term, 3-0-0). Offered in alternate years.

BIOCH 512. *Metabolic and Cellular Control Mechanisms.* ★3 (Second Term, 3-0-0). Offered in alternate years.

BIOCH 521. *Nucleic Acids.* ★3 (First Term, 3-0-0). Offered in alternate years.

BIOCH 531. *Chemistry of Proteins.* ★3 (Second Term, 3-0-0). Offered in alternate years.

BIOCH 581. *Structure and Function of Biological Membranes I.* ★3 (First Term, 3-0-0). A general survey of structure and function of biological membranes. The structure and properties of various phospholipid-water model membrane systems and the molecular interactions of these systems with ions, sterols, antibiotics and proteins will be considered initially. The composition, molecular architecture and many of the functions of biological membranes will then be discussed, with emphasis on the important role of phospholipids in determining many of the structural and functional properties of these complex structures. Use of the current literature will be stressed. Prerequisites: BIOCH 300 and CHEM 370 or 372 or consent of the Department. Note: Designed for advanced honors and graduate students and offered in alternate years.

BIOCH 582. *Structure and Function of Biological Membranes II.* ★3 (Second Term, 3-0-0). Selected topics in membrane biochemistry. These will include bioenergetics and membrane transport and the role of membranes in the regulation of specific intracellular and intercellular phenomena. Prerequisites: BIOCH 581 or consent of the Department. Note: Designed for advanced honors and graduate students and offered in alternate years.

BIOCH 608. *Macromolecular Structure Analysis I.* ★3 (First Term, 3-0-3). The application of electron microscopy to the examination of the structures of macromolecular assemblies such as viruses and membranes. Emphasis on preparation techniques, using the transmission EM, and interpreting micrographs. Designed for senior honors and graduate students. Prerequisite: Consent of the instructor. Maximum enrollment of 10 students. Offered in alternate years.

BIOCH 609. *Macromolecular Structure Analysis II.* ★3 (Second Term, 3-0-3). The principle of x-ray crystallography as applied to the study of protein and nucleic acid structure. Students will collectively carry out a structural determination of a suitable small molecule of biological interest. Designed for senior honors and graduate students. Prerequisite: Consent of the instructor. Maximum enrollment of 10 students. Offered in alternate years.

BIOCH 623. *Special Topics in Research on Polynucleotides.* ★2 (0-2s-0).

BIOCH 626. *Special Topics in Protein Research.* ★2 (0-2s-0). A seminar course for advanced students. Detailed consideration is given to recent advances in research on protein structure and function and mechanism of enzyme action. Prerequisites: BIOCH 511 and 531 or consent of the Department.

BIOCH 630. *Elements of Modern Biophysics.* ★3 (both terms, 1.5-0-0). Course content will vary from year to year but will include topics such as quantum mechanics for biochemists, nuclear magnetic relaxation theory, and fluorescence spectroscopy. Intended for graduate students in the biological sciences interested in physical techniques and their application to studies of biological systems. Format will include seminars by students themselves. Prerequisite: Consent of the instructor.

BIOCH 671. *Recent Advances.* ★2 (0-2s-0). A seminar course on topics of current interest in Biochemistry. Note: Open to Graduate students in Biochemistry only.

Courses in Clinical Biochemistry are listed under § 124.16 (Pathology).

124.6 Biomedical Engineering and Applied Sciences

124.6.1 GENERAL INFORMATION

The Division provides research facilities and lecture courses leading to the M.Sc. degree. Additionally, students registered for M.Sc. or Ph.D. degrees in other University Departments have the possibility of conducting studies within the Division.

In the year 1979/1980 students from the Departments of Electrical Engineering, Radiology, Surgery and Zoology participated in the collaborative programs.

The major areas of research are in medical physics, organ preservation, neuro-physiology, and instrumentation.

124.6.2 GRADUATE COURSES

EE/BE 512. *Physical Measurements in Medicine.* ★3 (Second Term, 3-1s-0). Properties of the cell membrane. Nernst-Planck equation, Donnan membrane, constant field membrane, membrane impedance. Action potentials, voltage clamp measurements, membrane conductance H-H equations, nerve conduction. Mathematical models of the axon. Electrodes. Gas and blood gas analysis. The E.C.G., E.E.G., and the E.M.G., origin and type of these signals, measurement techniques. Blood flow and blood pressure measurements (invasive and non-invasive). Safety aspects of electrical equipment in medicine. Prerequisite: Consent of Department. (□ 3.5.)

BEAS 600. *Seminars in Biomedical Engineering and Applied Sciences.* ★2. (First Term, 0-2s-0). A series of seminars designed to expose graduate students to the various areas of research and to provide a forum for progress reports in individual areas. Seminars from research workers from inside and from outside the University will be included. Seminars are held in an informal atmosphere with ample opportunity for discussion.

124.7 Community Medicine

124.7.1 UNDERGRADUATE COURSES

CO ME 411. *Whole Class and Group Discussions.* ★2 (20 hours). The whole class lectures introduce students to the importance of epidemiology, demography, life styles, etc., in understanding disease causation. The small group sessions provide students their first opportunity to participate in patient interviews and case studies.

CO ME 421. ★1 (12 hrs.). A series of whole class lectures on behavioral sciences in medicine and occupational health.

CO ME 431. ★1. A series of formal presentations on topics pertinent and relevant to the practice of medicine.

124.7.2 ELECTIVES

CO ME 447. ★0 (4 weeks). A wide range of elective programs are offered through the Department of Community Medicine including Provincial Health Units, Northern Medicine, Occupational Health, Industrial Health, Toxicology, Epidemiology, Community Health Resources, Health Care Delivery, Behavioral Sciences in Medicine and Rehabilitation Medicine.

124.7.3 GRADUATE COURSES

See § 204.18 of the Faculty of Graduate Studies and Research Calendar.

124.7.4 GRADUATE TRAINING

Community Medicine. A four-year residency program of training towards certification by the Royal College of Physicians and Surgeons in Community Medicine is offered by the Department. Details can be obtained from the Department Chairman.

124.8 Elective Courses

A Program of electives described in the Faculty Elective Catalogue forms a mandatory part of Phase III (see § 123.1.4). Co-ordinator — Dr. W. W. Yakimets.

Elective courses may be taken in Phase I and Phase II or in the summer between Phases at the discretion of the student and with the consent of the department.

124.9 Health Services Administration

124.9.1 UNDERGRADUATE COURSES

H S A 300. *Health Care in Modern Society.* ★3 (either term, 3-0-0). An introduction to the structure and functions of the modern health care system.

H S A 310. *Hospital Organization and Management.* ★3 (either term, 3-0-0). An introduction to the principles and problems of organization and management of the modern hospital.

H S A 350. *Accounting and Finance in Health Service Agencies.* ★3 (either term, 3-0-0). An introduction to the principles and methods of accounting and finance in health and welfare organizations.

H S A 351. *Managerial Accounting in Health Service Agencies.* ★3 (either term, 3-0-0). The utilization of accounting and financial data for optimizing the efficiency and effectiveness of health services.

INT D 357. *Health Care Economics.* ★3. Resource allocation in the health care industry; production and cost relationships within various types of institutional settings (hospital, medical firm); the role or the price mechanism in allocating resources. Manpower planning, the role of the government and professional groups in allocating resources in the non-price sector of the health industry.

NOTE: These courses are normally offered only during the Spring Session.

124.9.2 GRADUATE COURSES

H S A 400. *Health and Welfare Delivery Systems.* ★3 (First Term 3-0-0). A review of the development of the Canadian health and welfare system and of its comtemporary structure and functions.

H S A 401. *Problems and Issues in Health and Welfare Delivery* ★3 (Second Term, 3-0-0). Analysis of selected problems in the delivery of health and welfare services.

H S A 410. *Hospital Organization and Management.* ★3 (Second Term, 3-0-0). The historical, contemporary, and emergent structure, functions, and problems of the hospital as a community health resource. Lectures and field trips.

H S A 411. *Medical Care Administration.* ★3 (Second Term 3-0-0). The development of modalities for the delivery of medical care and their contemporary and emergent structure, functions, and problems. Lectures and field trips.

H S A 412. *Social Welfare Administration.* ★3 (Second Term 3-0-0). An introduction to the structure and functions of social welfare programs.

H S A 420. *Structure and Process in Health and Welfare Service Agencies.* ★3 (First Term, 3-0-0). An introduction to the application of social science theory and research to the administration of health and welfare agencies.

H S A 421. *Management of Health and Welfare Service Agencies.* ★3 (either term, 3-0-0). Applications of social science theory and research findings to the administration of health and welfare agencies. Lectures and field projects.

H S A 430. *Methods and Statistics in Health Services Administration: I.* ★3 (First Term, 3-0-0). An introduction to statistical theory and statistical tests as they relate to research and decision making in health service agencies.

H S A 431. *Methods and Statistics in Health Services Administration: II.* ★3 (Second Term, 3-0-0). An introduction to basic methodological procedures as they apply to research and decision making in health services administration.

H S A 435. *Survey of Epidemiology.* ★3 (First Term, 3-0-0). An introduction to the basic principles of epidemiology and vital statistics, and their uses in the study of the natural history of disease, with special reference to communicable disease.

H S A 450. *Health Service Accounting.* ★3 (First Term, 3-0-0). An introduction to managerial accounting in the context of health service agencies. The special problems of cost-benefit analysis and of cost control in health service organizations.

H S A 451. *Application of Managerial Accounting to Health Service Agencies.* ★3 (Second Term, 3-0-0). A review of budgeting and cost control techniques in health and welfare service agencies.

H S A 460. *Electronic Data Processing and Computer Utilization for Health Service Administrators.* ★3. (First Term, 3-0-0). Introduction to computer hardware and software, data structures and processing, basic algorithms and programming languages. Management information systems in health services administration.

H S A 470. *Introductory Health Care Economics.* ★3 (First Term, 3-0-0). An introductory survey of macroeconomic, microeconomic, and public finance models that are relevant to the health care field.

H S A 471. *Application of Economic Principles to Health Services Administration.* ★3 (Second Term, 3-0-0). A survey of health care economic theory and empirical studies. Topics and areas covered include (a) demand, supply, and utilization; (b) production and costs; (c) resource allocation in health care labour markets; (d) selected facets of health care planning; and (e) benefit-cost analysis. The empirical studies examined in this course require an understanding of simple and multiple regression techniques.

H S A 499. *Field Practicum.* ★6 (May 1-Aug. 31). A four month summer field experience practicum supervised by the faculty.

H S A 500. *Advanced Problems in Health Care Delivery.* ★3 (3-0-0). Critical analysis and evaluation of contemporary problems and emerging trends in the structure of the health and welfare delivery system in Canada as well as limited cross-cultural comparison of health care delivery systems. †

H S A 510. *Advanced Hospital Administration.* ★3 (either term, 3-0-0). Selected topics in manpower management and forensic medicine. †

H S A 511. *Special Seminar in Health Services Administration.* ★3 (0-3s-0). Selected topics in non-parametric statistics as applied to research in health services administration. †

H S A 513. *Nursing Service Administration.* ★3 (Second Term, 3-0-0). Identifying nursing service needs and approaches in diverse and rapidly changing health care systems, with particular emphasis on the changing role of chief nursing executives in health care agencies.

H S A 520. *Principles of Health Service Administration.* ★3 (either term, 3-0-0). A review of social science theory, method, and research findings as they relate to the administration and management of health and welfare service agencies.†

H S A 530. *Statistics for Health Service Administration.* ★3 (First Term, 3-0-0). A survey of basic vital, epidemiology, and probability statistics as applied to administrative planning, research, and problem solving in health service agencies.

H S A 531. *Research Methods in Health Service Administration.* ★3 (Second Term, 3-0-0). An overview of research needs, priorities, and approaches in health services administration. Emphasis on a practical, systematic approach to improving the quality and quantity of health and welfare services.

H S A 535. *Problems and Issues in Epidemiology.* ★3 (Second Term, 3-0-0). Review and discussion of contemporary epidemiological problems from the viewpoint of multifactorial aetiology, and the application of epidemiological principles to the study of chronic disease and accidents.

H S A 550. *Health Services Finance.* ★3 (First Term, 3-0-0). Cost accounting and budget applications in health and welfare service agencies. Methods of formulating and implementing organization policy in the context of contemporary health and welfare financial structures and policies.

H S A 551. *Problems and Issues in Health Services Finance.* ★3 (Second Term, 3-0-0). Critical analysis of selected issues and problems in health and welfare services finance.

H S A 560. *Planning and Operations Analysis in Health Services Administration.* ★3 (First Term, 3-0-0). Service population concept, catchment areas, and forecasting resource requirements. Network analysis, linear programming, queuing and simulation techniques in planning and administration of health service programs.

H S A 561. *Systems Analysis in Health Care Delivery.* ★3 (Second Term, 3-0-0). Statistical decision making and quality control techniques. Data acquisition methods. Work study methods and quantitative techniques in personnel management. Design of health care delivery evaluation systems.

H S A 570. *Health Care Economics.* ★3 (First Term, 3-0-0). Methods of allocating resources to the health care sector of the economy. The role of individuals and organizations in the decision process.

H S A 571. *Problems and Issues in Health Care Economics.* ★3 (Second Term, 3-0-0). Critical review and discussion of contemporary issues and problems in Canadian health care economics.

H S A 600. *Advanced Seminar in Health and Welfare Services Administration.* ★3 (First Term, 0-3s-0). Discussion and analysis of significant issues and problems in health and welfare administration.

H S A 601. *Advanced Seminar in Health and Welfare Services Delivery.* ★3 (Second Term, 0-3s-0). A proseminar on problems of health and welfare services delivery. Senior faculty and selected guests will participate.

H S A 610. *Conference Course.* ★3 (0-3s-0). Special readings seminar. †

H S A 630. *Quantitative Techniques in Health Services Planning and Evaluation: I.* ★3 (First Term, 3-0-0). Application of quantitative techniques to the planning and evaluation of health services with particular emphasis on intra-institutional problems. †

H S A 631. *Quantitative Techniques in Health Services Planning and Evaluation: II.* ★3 (Second Term, 3-0-0). Application of quantitative techniques to the planning and evaluation of health services with particular emphasis on intra-institutional and systemic problems. †

H S A 900. *Non-Thesis Project.* ★3 (variable). Preparation of a major research paper under faculty supervision.

† May not be offered in any given year, depending on student interest and available faculty resources.

124.10 Immunology

124.10.1 UNDERGRADUATE COURSES

Instruction in Immunology is included in Medicine 421. The Department of Immunology also offers elective undergraduate courses.

IMMUN 447. ★0 (4 weeks). Supervised laboratory and reading programs in immunology. Available for students in Phase III only.

Interested students should consult the entries for the Departments of Medicine and Pathology in this calendar, and for the Departments of Genetics (§ 184.11), Microbiology (§ 184.22), and Zoology (§ 184.32) in the Faculty of Arts and Science Calendar.

124.10.2 GRADUATE COURSES

IMMUN 500. *Current Topics in Immunology.* ★3 (Second Term, 3-0-0). Lecture and discussion sessions based on original factual and theoretical papers. Topics include the origin of antibody diversity, humoral and cell-mediated immunity, cellular collaboration, positive and negative regulatory mechanisms in immunity, self tolerance, unresponsive states, autoimmunity, transplantation, and immunogenetics. Students will be expected to prepare seminars on assigned topics. Prerequisite: Consent of the Department. Offered alternate years.

124.11 Interdepartmental Courses

124.11.1 UNDERGRADUATE COURSES

The Faculty conducts some of its instruction on an interdepartmental basis. This is particularly true in relation to the second year M.D. courses listed separately below.

MED 421. *Mechanisms of Disease.* ★31. Medically oriented subjects: (a) Electrolyte Balance (8 hours), (b) Clinical Skills (22 hours), (c) Cardiovascular System (78 hours), (d)

Endocrinology and Metabolism (54 hours), (e) Gastrointestinal System (70 hours), (f) Genetics (14 hours), (g) Hematology (62 hours), (h) Immunology (16 hours), (i) Infectious Diseases (72 hours), (j) Nephrology (44 hours), (k) Oncology (20 hours), (l) Pulmonary (60 hours), (m) Rheumatology (24 hours). Surgically oriented subjects: (n) Otolaryngology (4 hours), (o) Ophthalmology (28 hours), (p) Supplementary Surgery (90 hours), (q) Urology (44 hours).

NEURO 421. *Neurological Sciences.* ★5 (2-0-2). An integrated course in neuroanatomy, neuropathology, neuroradiology, neuropharmacology, neurology, and neurosurgery. Instructors: members of the Departments of Anatomy, Neurology, Neuroradiology, Neurosurgery, Pharmacology, and Pathology.

124.12 Medicine and Clinical Medicine

124.12.1 UNDERGRADUATE COURSES

MED 411. ★2 (54 hours). A course in the communication skills necessary for effective history taking and in the applied anatomy of the body regions.

MED 434. ★P-F (Second Term, 15 hours). General aspects of medicine with particular reference to local and systematic diseases of dental interest.

MED 441. ★0 (125 hours). A lecture series offered only for students in Phase III.

MED 442. ★2 (56 hours). A review of topics in Internal Medicine. For fourth year medical students only.

MED 446. ★12 (16 weeks). Student Internship for students in Phase III only. Dr. G. Molnar and staff.

124.12.2 ELECTIVES

MED 447. ★0 (four weeks). An elective program in Medicine and its subspecialties is offered for students in Phase III.

124.12.3 GRADUATE COURSES

MED 501. *Clinical Pulmonary Physiology.* ★3 (Second Term, 2-0-0). Basic and clinical lectures on: Lung Structure; Pulmonary Blood Flow; Airflow; Gaseous Diffusion; Ventilation/Perfusion Matching; Control of Ventilation; Oxygen Transport; Lung Defense; Mucociliary Transport; ARDS; Asthma; Exercise; Lung Growth; Surfactant; Lung Metabolism; Pulmonary Function Testing. Prerequisite: General courses in Physiology, Physics and Biochemistry or consent of the Department.

124.12.4 GRADUATE TRAINING

Complete residency training programs are offered in Internal Medicine and in the subspecialties of Cardiology, Gastro-enterology, Nephrology, Neurology, Pulmonary Disease, Rheumatology, Infectious Diseases, Oncology, and Endocrinology by the appropriate Divisions of the Department of Medicine. In the course of these programs, residents complete an appropriate period of training in internal medicine (two or three years depending on the subspecialty involved) followed by two years of advanced experience in the specialty concerned. Opportunities for both clinically orientated and basic research are made available during these latter two years. All programs are designed to meet the requirements of the Royal College of Physicians and Surgeons of Canada and in the course of the programs, which cover a minimum of four years, residents pass through:

	Weeks
MED 541 First Year Medicine	52
MED 542 Second Year Medicine	52
MED 543 Third Year Medicine or Subspecialty	52
MED 544 Fourth Year Medicine or Subspecialty	52

and are assessed before promotion from year to year. Those electing a research experience as part of their programs may register with the Faculty of Graduate Studies and Research in a program leading to the M.Sc. in Experimental Medicine. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.13 Obstetrics and Gynaecology

124.13.1 UNDERGRADUATE COURSES

OB GY 431. *Obstetrics and Gynaecology.* ★3 (80 hours). An introduction to Obstetrics and Gynaecology. Dr. R. P. Beck and staff.

OB GY 446. ★6 (8 weeks). Student internship for students in Phase III only. Dr. R. P. Beck and staff.

OB GY 447. ★0 (4 weeks). Supervised clinical experience in Obstetrics and Gynaecology in affiliated hospitals.

124.13.2 GRADUATE TRAINING

A complete residency program is offered in Obstetrics and Gynaecology by the Department of Obstetrics and Gynaecology and the affiliated hospitals including two years of approved training in Obstetrics and Gynaecology and options in the same and related disciplines to a total of two further years. In the course of this program which covers a minimum of four years, residents pass through:

	Weeks
OB GY 541 First Year Obstetrics and Gynaecology	52
OB GY 542 Second Year Obstetrics and Gynaecology	52
OB GY 543 Third Year Obstetrics and Gynaecology	52
OB GY 544 Fourth Year Obstetrics and Gynaecology	52

and are assessed before promotion from year to year of the program by on-the-job assessment and three formal examinations during the year. Every Wednesday afternoon is devoted to formal resident education (4 hours) with visiting professors, rounds and seminars. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.14 Ophthalmology

124.14.1 UNDERGRADUATE COURSES

Ophthalmology is included in Medicine 421, Medicine 446 and Surgery 446.

124.14.2 ELECTIVES

OPHTH 447. ★0 (2 weeks). Supervised clinical experience in Ophthalmology in affiliated hospitals. Available for Phase II students only.

124.14.3 GRADUATE TRAINING

The Department of Ophthalmology offers a graduate training program which fulfills the requirements for experience in ophthalmology of the Royal College of Physicians and Surgeons of Canada. For Residents requiring four years of training a first year rotation through medical specialties related to ophthalmology is available, followed by three years of ophthalmic training. For Residents requiring only three years of training a straight three year ophthalmic programme is provided. Two residency places are available in each of the four years. Residents pass through:

	Weeks
OPHTH 541 Pre-ophthalmology Rotation in Medicine	52
AND / OR	
OPHTH 542 First Year Ophthalmology	52
OPHTH 543 Second Year Ophthalmology	52
OPHTH 544 Third Year Ophthalmology	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.15 Paediatrics

124.15.1 UNDERGRADUATE COURSES

PAED 446. ★6 (8 weeks). Student internship for students in Phase III only. Dr. E. E. McCoy and staff.

124.15.2 ELECTIVES

PAED 447. ★0 (4 weeks). Supervised clinical experience in Paediatrics in affiliated hospitals. Available for Phase III students only.

124.15.3 GRADUATE TRAINING

A complete residency program is offered in Paediatrics by the Department of Paediatrics using affiliated hospitals and other child care facilities in Edmonton. During the course of this program, residents complete three years of basic training in child health and disease, followed by one further year of intensive training. Opportunities for basic and applied research are available. The four year program is designed to meet the requirements of the Royal College of Physicians and Surgeons of Canada for certification in Paediatrics, and residents pass through:

	Weeks
PAED 541 First Year Paediatrics	52
PAED 542 Second Year Paediatrics	52
PAED 543 Third Year Paediatrics or sub-specialty	52
PAED 544 Fourth Year Paediatrics or sub-specialty	52

and are assessed before promotion each year. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.16 Pathology

124.16.1 UNDERGRADUATE COURSES

PATH 231. *Introduction to Histopathology.* ★3 (First Term, 3-0-3). This course will deal with the structure of the cell, elementary histopathological processes and their appearances in tissue sections. The course content will include the theory and practice of light microscopy and the principles of electron microscopy. Students will be expected to acquire a detailed knowledge of the theory and application of the histological and histochemical techniques used to demonstrate the diagnostic features of disease processes. Studies will include the nature of malignant disease, including its application to exfoliative and aspiration cytology.

PATH 291. *Introduction to Laboratory Medicine.* ★3 (Second Term, 3-0-2). Designed for first year students in the Medical Laboratory Science program. The course will introduce the students to those aspects unique to clinical laboratories including safety, instrumentation, medical terminology and quality assurance applied to reagents and methodology. Where appropriate, demonstrations of techniques and equipment will be included in laboratory sessions.

CL PA 367. *Hematology.* ★6 (3-0-6). Lectures: the use and interpretation of laboratory methods as diagnostic aids. Laboratory: exercises to develop a high degree of accuracy and reasonable speed in hematological and other clinical pathological procedures used in modern hospital laboratories. Prerequisite: PHYSL 261 or consent of the Department. Corequisite: PATH 231.

CLBIO 369. *Clinical Biochemistry.* ★6 (3-0-3). Principles of instrumentation; quality control; clinical chemistry of blood and urine, gastric, kidney, and liver function tests; disturbances of acid-base, electrolyte, and mineral metabolism. Emphasis on critical appraisal of biochemistry methods as applied to the study of disease. Prerequisites: CHEM 200 or 202 and 250.

PATH 400. *Medical Laboratory Science I.* ★24 (52 weeks). A year spent in rotation in the following hospital departments: bacteriology, clinical chemistry, hematology, blood banking, and histology. Lectures, tutorials, weekly conferences, and semi-monthly seminars, followed by a comprehensive theoretical and practical examination.

PATH 401. *Medical Laboratory Science II.* ★6 (3-0-6). Lectures, seminars, and laboratory exercises on the approach and method of investigation of selected medical laboratory problems; laboratory planning and administration; the use of special equipment and techniques.

CLBIO 408. *Clinical Biochemistry.* ★3 (Second Term, 3-0-0). Advanced lectures on special topics, including: lactic acidosis, gluconeogenesis, ethanol metabolism, cyclic AMP, prostaglandins, clinical enzymology, inborn errors of metabolism, purine metabolism, aging. Prerequisite: BIOCH 300, 372, or 400.

PATH 411. *General Pathology.* ★2. Twenty lectures on the pathological reactions of human tissues and four 2 hour Laboratory periods.

PATH 421. *Special Pathology.* ★3. Forty-two lectures on the special pathology of human disease and twelve 2 hour Laboratory periods.

PATH 422. *General Pathology.* ★3 (First Term, 46 hours). Lectures on the principles of pathology, laboratory instruction in histo-pathology and an introduction to the functions of a pathology laboratory in a hospital.

PATH 441. *Clinicopathologic Studies.* ★1. Fifteen lectures on selected aspects of human disease emphasizing the application of anatomical pathology to clinical medicine.

124.16.2 ELECTIVES

PATH 447. ★0 (8 weeks). Supervised clinical experience in pathology in affiliated hospitals and laboratories. Available for Phase III students only.

124.16.3 GRADUATE COURSES

PATH 501. *Cellular and Tissue Structure and General Mechanisms of Disease.* ★6 (4-0-1). Advanced seminars on the Cell Cycle; Instrumentation and Techniques of Electron Microscopy; Pathobiology of Lysosomes, Mitochondria and Endoplasmic Reticulum; Humoral and Cellular Mechanisms in Immunology; Hypersensitivity; Autoimmune Diseases; Immunology of Cancer; Immunodeficiency Diseases; Transplantation Immunity; Evaluation of Renal Function; Glomerular Disease; Renal Vascular Diseases; Renal Transplantation; Renal Tumors; Hormonal Mammary Dysplasia; Mammary Tumors; Liver Function Tests; Viral Hepatitis; Cholestasis; Alcoholic Liver Disease; Acute and Chronic Hepatitis; Neoplasms of Liver; Fetal and Neonatal Pathology; Diseases of the Placenta. To be offered in alternate years.

PATH 502. *Cellular and Tissue Structure and General Mechanisms of Disease.* ★6 (4-0-1). Advanced seminars on Collagen Structure and Function; Blood Coagulation; Bleeding Disorders; Thrombosis and Embolism; Shock; Atherosclerosis; Amyloidosis; Glycogen Storage Diseases; Diabetes Mellitus; Parathyroid Pathology and Metabolic Bone Disease; Disorders of Melanin Metabolism; Nevi and Melanomas; Pathology of Skeletal Muscle; Pathology of the Small Intestine; Pathology of the Colon; Pulmonary Pathology; Pathology of Lymphoid Organs; Parasitology. Prerequisite: Pathology 501, or consent of the Department. To be offered in alternate years.

PATH 503. *Advanced Haematology.* ★3 (Second Term, 3-0-0).

PATH 504. *Seminars in General Pathology.* ★1 (either term, 1-0-0).

PATH 505. *Fundamentals of Histochemistry.* ★2 (First Term, 2-0-0).

PATH 506. *Medical Biochemistry.* ★6 (2-0-0). Advanced seminars on instrumentation, Hepatic, Renal, Pancreatic Endocrine and Exocrine Functions; Enzymology and Diagnostic Applications of Enzyme Determinations, Hyperlipidaemis. Prerequisite: Undergraduate courses in Medical Physiology and Biochemistry. To be offered in alternate years.

PATH 507. *Medical Biochemistry.* ★6 (2-0-0). Advanced seminars on Metabolic Disorders of Carbohydrates and Amino Acids, Nutritional Deficiencies and Malnutrition, Endocrine Functions, Organization and Quality Control in Medical Biochemistry. Prerequisite: Pathology 506 or consent of the Department. To be offered in alternate years.

PATH 508. *Haematology Special Project.* ★3 (Second Term, 0-0-3).

PATH 509. *Clinical Chemistry Special Project.* ★3 (Second Term, 0-0-3).

PATH 510. *Cryobiology.* ★6 (2-1s-0). Scope and historical development. Current theories of interactions of living cells with physical and chemical alterations in the environment during cooling to and warming from low temperatures. Freeze-thaw responses of enzymes, single cells and organized tissues. Preservation of spermatozoa for artificial insemination, red blood cells for transfusion and embryos. Approaches to organ preservation. Cooling of whole animals including humans. Applications to cryosurgery, frostbite, and food preservation.

PATH 610. *Subcellular Morphology.* ★2 (Second Term, 2-0-0).

NOTE: PATH 501 and 502 are intended for Residents in Pathology, Medical Microbiology, Surgery, or Medicine. There are currently no other graduate courses available on *human diagnostic pathology*. PATH 506 and 507 are intended for Residents in Pathology, Medical Microbiology, Surgery, or Medicine, and graduate students from the Medical Laboratory Science Program. There are currently no other graduate courses available on *medical biochemistry*.

NOTE: Not all graduate courses are offered every year. The Chairman of the Department should be consulted regarding the availability of graduate courses in any academic session.

124.16.4 GRADUATE TRAINING

Complete residency programs are offered in the various aspects of Laboratory Medicine by the Departments of Pathology and Medical Bacteriology and the affiliated hospitals. Programs may be taken in the following branches of Laboratory Medicine: General Pathology, Anatomical Pathology, Haematological Pathology, Medical Biochemistry, Medical Microbiology and Neuropathology. In the course of these programs, which each cover a minimum of four years, residents pass through:

	Weeks
PATH 541 First Year Pathology	52
PATH 542 Second Year Pathology	52
PATH 543 Third Year Pathology	52
PATH 544 Fourth Year Pathology	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.17 Pharmacology

124.17.1 UNDERGRADUATE COURSES

PMCOL 222. *Drugs, Medicine and Man.* ★3 (either term, 3-0-0). This course is designed to acquaint the student with limited scientific background with many aspects of drug use and abuse in our society. Some of the topics to be covered will include mind-altering drugs, treatment of pain, herbal and folk medicine, antibiotics, nerve gases and insecticides, food additives and vitamins, over-the-counter drugs, poisons, and toxins, and health quackery. Prerequisite: None.

PMCOL 411. *Principles of Pharmacology.* ★4 (72 hours). Lectures and laboratory exercises are used to illustrate the basic principles of pharmacology. Emphasis is placed on the pharmacology of drugs affecting the autonomic nervous system and on those agents used for antimicrobial therapy. The course is offered only to medical students during Phase I of their program.

PMCOL 421. *Basic Principles of Therapeutics and Toxicology.* ★3 (2-0-0). Lectures and panel discussions are used to illustrate the principles of Toxicology and the rational use of drugs in the treatment of common diseases. The course is offered only to medical students during Phase II of their program.

PMCOL 431. *General Pharmacology.* ★6 (3-0-3). Available to students in the Faculty of Pharmacy only.

PMCOL 432. *General Pharmacology.* ★6 (3-0-3). Available for graduate and science students. Prerequisites or corequisites: BIOCH 300 and PHYSL 410 and consent of the Department.

PMCOL 435. *Experimental Procedures in Pharmacology.* ★3 (either term, 0-1s-6). A laboratory course intended primarily for honours pharmacology students and advanced students in related disciplines. Using both intact and isolated tissue preparations students will perform a variety of experiments of types commonly encountered in applied pharmacology and in pharmacological research. The laboratory sessions will include didactic material and instruction in: animal handling, humane methods of euthanasia, anesthesia, body fluid sampling, administration of drugs and elementary surgical and dissection techniques required in the experiments. Prerequisite: Consent of the Department. Previous instruction in mammalian physiology is recommended.

PMCOL 436. *Analytical Techniques in Pharmacology.* ★3 (either term, 0-0-6). Emphasis will be on the use of modern techniques as they are applied to pharmacological problems. The course will include practical instruction and experiences in such techniques as spectrophotometry, spectrofluorimetry, chromatography, subcellular fractionation, gel electrophoresis, electron microscopy and several others. Prerequisite: Consent of the Department.

PMCOL 470. *General Pharmacology.* ★6 (104 hours). Available to students in the Faculty of Dentistry only.

PMCOL 498. *Pharmacology Research Program.* ★6 (0-0-6). Available to fourth year honors students only. Prerequisite: Consent of the Department.

PMCOL 499. *Pharmacology Honors Seminar.* ★0 (0-1s-0). Available to fourth year honors students only. Prerequisite: Consent of the Department.

D HYG 305. *General Pharmacology.* ★2 (First Term, 2-0-0). Available to dental hygiene students only.

124.17.2 ELECTIVES

PMCOL 447. ★0 (4 weeks). Elective program in Pharmacology offered only to Phase III students.

124.17.3 SPECIALIZATION / HONORS COURSES

The Pharmacology courses which are offered as part of the B.Sc. (Specialization / Honors) program, are also listed in the Faculty of Arts and Science Calendar.

124.17.4 GRADUATE COURSES

NOTE: Not all graduate courses are offered every year. The Chairman of the Department should be consulted regarding the prerequisites for and availability of graduate courses in any academic session.

PMCOL 501. *Pharmacology Tutorial, Research and Reading Course.* ★3 (First Term, 3-0-0).

PMCOL 502. *Pharmacology Tutorial, Research and Reading Course.* ★3 (Second Term, 3-0-0).

PMCOL 508. *Molecular Pharmacology.* ★3 (either term, 3-0-0).

PMCOL 509. *Neuropharmacology.* ★3 (either term, 3-0-0).

PMCOL 510. *Advanced Topics.* ★3 (First Term, 3-0-0).

PMCOL 511. *Advanced Topics.* ★3 (Second Term, 3-0-0).

PMCOL 555. *Introduction to Clinical Pharmacology for the Anaesthetist.* ★3 (First Term, 2-0-0). This course consists

lecture/tutorial sessions on special topics in pharmacology of particular interest to the anaesthetist. These include pharmacokinetics, pharmacodynamics, drug interactions, local and general anaesthetics, analgesics, vasodilators, antihypertensive drugs and neuromuscular blocking agents. Prerequisite: Resident in Anaesthesia.

PMCOL 600. *Seminar in Pharmacology.* ★0 (0-1s-0).

PMCOL 601. *The Actions of Drugs on Membranes.* ★3 (either term, 3-0-0).

PMCOL 602. *Clinical Pharmacology.* ★3 (either term, 2-0-0).

124.18 Physiology

124.18.1 UNDERGRADUATE COURSES

PHYSL 261. *Elementary Physiology.* ★6 (3-0-0; 3-0-3). Available only to students in the Faculties of Rehabilitation Medicine, Nursing and the Medical Laboratory Science program in the Faculty of Medicine.

PHYSL 262. *Elementary Physiology.* ★6 (3-0-0). Available only to students in the Faculty of Rehabilitation Medicine and the Faculty of Nursing.

PHYSL 403. *Neurophysiology.* ★3 (First Term, 3-0-0). An advanced course in neurophysiology aimed at giving students a thorough understanding of the integrative mechanisms in the visual and somaesthetic systems and the nervous control of movement. Prerequisites: PHYSL 410 or equivalent and consent of the instructor. Offered alternate years to PHYSL 505.

PHYSL 404. *Cardiovascular Physiology.* ★3 (Second Term, 3-0-0). The course will emphasize general concepts in human cardiovascular physiology: properties of the myocardium, hemodynamics and control of the cardiovascular system; applications in the response to exercise, hemorrhage and cardiac failure; hypertension. Prerequisites: PHYSL 410 or equivalent and consent of the instructors. Offered alternate years to PHYSL 501.

PHYSL 410. *Physiology.* ★6 (3-0-3; 3-0-0). Available for Graduate and Science students. Prerequisites: BIOL 130 or 299, CHEM 200 and 250 or 350.

PHYSL 411. *Medical Physiology.* ★6 (170 hours). Open to medical students only. Consists of a comprehensive lecture and laboratory course in mammalian and human physiology, designed to fulfill the requirements of medical students.

PHYSL 451. *Human and Oral Physiology.* ★6 (45 hours). Available to students in the Faculty of Dentistry only.

PHYSL 452. *Human Physiology.* ★6 (3-0-0; 3-0-3). Available to students in the Faculty of Pharmacy only.

124.18.2 ELECTIVES

PHYSL 447. ★0 (4 weeks). Elective program in Physiology offered only to Phase III medical students.

124.18.3 GRADUATE COURSES

PHYSL 403. *Neurophysiology.* ★3 (First Term, 3-0-0).

PHYSL 404. *Cardiovascular Physiology.* ★3 (Second Term, 3-0-0).

PHYSL 501. *Topics in Cardiovascular Physiology.* ★3 (Second Term, 3-0-0).

PHYSL 502. *Problems in Current Research.* ★3 (either term, 0-0-3). Individual study.

PHYSL 503. *Biophysics of Nerve and Muscle.* ★3 (Second Term, 3-0-0).

PHYSL 504. *Physiology of Reproduction.* ★3 (Second Term, 3-0-0).

PHYSL 505. *Topics in Neurophysiology.* ★3 (First Term, 3-0-0).

PHYSL 506. *Tutorial and Seminar Course.* ★3 (either term, 0-3s-0). Guided reading course.

PHYSL 600. *Physiology Seminar.* ★0 (0-1s-0).

124.19 Psychiatry

124.19.1 UNDERGRADUATE COURSES

PSYCI 421. *Introduction to Psychiatry.* ★2 (30 hours). The course consists of 30 one hour lectures outlining the major syndromes and conditions in clinical psychiatry. Co-ordinator Dr. G. Hopkinson

PSYCI 446. ★6 (8 weeks). Student internship for students in Phase III only. Dr. G. Hopkinson and staff.

124.19.2 ELECTIVES

PSYCI 447. ★0 (4 weeks). Supervised reading program and experience in clinical psychiatry. Available for Phase III students only.

124.19.3 GRADUATE TRAINING

A complete residency program in Psychiatry, meeting the requirements of the Royal College of Physicians of Canada, is offered by the Department of Psychiatry and utilizes the University Hospital and other affiliated hospitals, clinics and services. During the program, residents complete two years of approved university-based training in Psychiatry and in addition, two further years of related clinical, basic science, or research work. During the four years, residents pass through:

	Weeks
PSYCI 541 First Year Psychiatry	52
PSYCI 542 Second Year Psychiatry	52
PSYCI 543 Third Year Psychiatry	52
PSYCI 544 Fourth Year Psychiatry	52

and are assessed periodically. Residents attend a series of seminars of approximately 400 hours covering clinical psychiatry, basic sciences and related topics. All residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine. Co-ordinator Dr. R. C. Bland.

124.20 Radiology

124.20.1 UNDERGRADUATE COURSES

Undergraduate training in radiology is included in Anatomy 411, Medicine 421 and Neurological Sciences 421.

124.20.2 ELECTIVES

RADDI 447. ★0 (4 weeks). Supervised experience in Diagnostic Radiology and related areas. Available for Phase III students only.

RADTH 447. ★0 (4 weeks). Elective in Radiation Oncology with emphasis on clinical and statistical aspects according to student interests. Restricted to Phase III students.

124.20.3 GRADUATE TRAINING

Diagnostic Radiology

A complete residency program is offered in Diagnostic Radiology by the Department of Radiology and the affiliated hospitals. In the course of this program, residents complete two and one-half years of approved training in Diagnostic Radiology and eighteen months in a variety of options in related disciplines. In the course of this program, which covers a minimum of four years, residents pass through:

	Weeks
RADDI 541 First Year Diagnostic Radiology	52
RADDI 542 Second Year Diagnostic Radiology	52
RADDI 543 Third Year Diagnostic Radiology	52
RADDI 544 Fourth Year Diagnostic Radiology	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

Nuclear Medicine

A complete residency program is offered in nuclear medicine by the Departments of Radiology and Pathology at the University of Alberta Hospital, Department of Nuclear Medicine at the Cross Cancer Institute and Department of Radiology at the Royal Alexander Hospital, Edmonton. In the course of this program, residents complete two years of approved training in nuclear medicine, one year of approved training in other imaging modalities and one year of approved training in a variety of options in related disciplines. In the course of this program, taking a minimum of four years, residents pass through:

	Weeks
RADNM 541 First Year Nuclear Medicine	52
RADNM 542 Second Year Nuclear Medicine	52
RADNM 543 Third Year Nuclear Medicine	52
RADNM 544 Fourth Year Nuclear Medicine	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

Radiation Oncology

A complete residency program is offered in Radiation Oncology by the Department of Radiology and the affiliated hospitals. In the course of this program, residents complete three years of approved training in Radiation Oncology and one year in related disciplines. In the course of this program, which covers a minimum of four years, residents pass through:

	Weeks
RADTH 541 First Year Radiation Oncology	52
RADTH 542 Second Year Radiation Oncology	52
RADTH 543 Third Year Radiation Oncology	52
RADTH 544 Fourth Year Radiation Oncology	52

and are assessed before promotion from year to year of the program. During the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.21 Surgery and Clinical Surgery

124.21.1 UNDERGRADUATE COURSES

SURG 431. ★2 (56 hours). A series of lectures and clinical sessions on Orthopaedic Surgery. Available for Phase III A medical students only.

SURG 446. ★9 (12 weeks). Student internship for students in Phase III only. Dr. H. T. G. Williams and staff.

124.21.2 ELECTIVES

SURG 447. ★0 (4 weeks). Supervised experience in Surgery and its subspecialties. Available for Phase III students only.

124.21.3 GRADUATE COURSES

SURG 500. *Experimental Surgery.* ★3 (Second Term, 0-0-3). Designed to introduce M.Sc. and Ph.D. candidates to basic experimental surgical procedures. Course will include: (a) surgical anatomy of laboratory animals, (b) basic surgical methods, (c) selected methods in experimental surgery. Prerequisite: Consent of the Department.

SURG 510. *Neurophysiology.* ★3 (Second Term, 3-0-0). Growth, degeneration, and regeneration in the nervous system. Prerequisite: Consent of the Department.

SURG 520. *Directed Reading in Biomedical Research.* ★3 (First Term, 3-0-0). Reading and study of problems and techniques in the biological sciences important to surgical research under the direction of one or more faculty members.

SURG 530. *Directed Reading in Biology and Medicine.* ★3 (either term, 3-0-0). Reading and study of topics in biomedical research of relevance to the student's interest under direction of one or more faculty members.

SURG 600. *Research Seminar.* ★2 (0-1s-0). A weekly series of seminars on current research is held during both terms. Graduate students must attend and make two presentations in this series.

124.21.4 GRADUATE TRAINING

Complete residency training programs are offered in General Surgery, Neurosurgery, Plastic Surgery, Orthopaedic Surgery, Otolaryngology, Thoracic and Cardiovascular Surgery, and Urology, by the corresponding Divisions of the Department of Surgery. Clinical experience is provided in the affiliated hospitals. All programs are designed to fulfill the requirements of the Royal College of Physicians and Surgeons of Canada and include appropriate experience in related surgical and, on occasion, non-surgical disciplines. The educational content of the clinical program is enriched through the provision of seminar courses designed specifically to meet the needs of trainees at various levels of the program, in addition to usual ward rounds and conferences conducted within the Department. Excellent facilities are available for basic and clinical surgical research, which is an integral part of the program for most subspecialties. Trainees electing to prepare for a graduate degree may register in the Faculty of Graduate Studies and Research in programs leading to the M.Sc. and Ph.D. in Experimental Surgery.

During the period of graduate specialty training, which covers a minimum of four years, residents pass through:

	Weeks
SURG 541 First Year Surgery	52
SURG 542 Second Year Surgery	52
SURG 543 Third Year Surgery	52
SURG 544 Fourth Year Surgery	52

and in the case of some subspecialty programs where a minimum of five years is required:

SURG 545 Fifth Year Surgery	52

They are assessed before promotion from year to year of the program and during the period of graduate specialty training, all residents are registered as full-time students in the Division of Postgraduate Medical Education of the Faculty of Medicine.

124.22 Courses Offered by Other Faculties

The courses listed below are required in first year of the Medical Laboratory Science Program.

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30.

CHEM 200. *Introductory University Chemistry.* ★6 (3-1s-3). Elements of bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: CHEM 100, or Chemistry 30, or equivalent.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (eg., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: CHEM 100, or Chemistry 30 or equivalent. Note: Students with credit in CHEM 200 or 202 normally will proceed to CHEM 350. Such students may enroll in CHEM 250 only if written consent of the Department is obtained.

Faculty of Nursing

131 INTRODUCTORY

131.1 Members of the Faculty

Professor Emeritus
R. E. McCLURE, M.P.H.

131.1.1 STAFF

Associate Professor and Acting Dean
P. A. FIELD, Ph.D.

Professor and Associate Dean
M. E. STEED, M.A.

Professors
S. M. STINSON, Ed.D.
A. E. ZELMER, Ph.D.

Associate Professors
M. BESWETHERICK, M.Sc.A. (on leave)
R. L. CAREY, Ph.D.
E. M. DAVIES, M.S.N. (on leave 1980-82)
T. DAVIS, Ph.D.
R. A. DAY, M.S.
K. A. DIER, M.Sc.
J. S. FORD, M.Sc.
B. HARRINGTON, M.N.
P. HAYES, M.H.S.A.
J. F. KIKUCHI, Ph.D.
P. KOT, M.N.

Assistant Professors
A. M. ANDERSON, M.Sc.N.
M. ANDERSON, M.N.
L. M. DAVIS, M.Ed.
I. D. FORREST, M.Ed.
J. LARSEN, M.Ed.
L. P. MULDER, M.Ed.
A. M. PAGLIARO, M.S.N.
L. I. REUTTER, M.S.
S. L. RICHARDSON, M.Ed.
G. D. TANNAHILL, M.A.
M. A. WALES, B.Sc.N.

Lecturers
J. A. BOMAN, B.Sc.N.
P. L. BROWN, B.Sc.N.
E. J. LIGOWSKI, B.Sc.N.
J. E. SMITH, B.Sc.N.

Associate Academic Staff
R. ARCAND, M.N.
K. MILLS, M.H.S.A.

Sessional Lecturers
I. E. CAMPBELL, B.Sc.N.
D. C. DAVIDSON, B.Sc.N.
G. FYSH, B.Sc.N.
M. KENWELL, B.Sc.N.
C. D. LITTLE, B.Sc.N.
C. L. PARK, B.N.
H. K. WILSON, M.Sc.N.

Administrative Officer
S. B. SHEPPARD

131.1.2 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Dean of the Faculty of Medicine
D. F. CAMERON, M.D., F.R.C.P.(C)., F.A.C.A.

Professor
J. N. CAMPBELL, Ph.D. (Microbiology)

Associate Professor
C. R. YEWCHUK, Ph.D. (Educational Psychology)

Assistant Professor
H. NORTHCOTT, Ph.D. (Sociology)

President, University Hospital
B. SNELL, F.R.C.P., D.P.H., F.A.C.H.A.

Vice-President (Nursing), University Hospital
L. A. YTTERBERG, B.N.

Director of Nursing, Royal Alexandra Hospital
C. LENNIE, M.N.

Representative, Alberta Association of Registered Nurses
A. R. MacKINNON, M.N.

Registrar of the University
W. A. BLANCHARD, Ph.D.

Library Representative
P. RUSSELL, B.L.S.

131.2 General Information

131.2.1 HISTORICAL NOTE

The School of Nursing was established under the Faculty of Medicine on September 28, 1923. At that time two programs were developed: a five-year program leading to the degree Bachelor of Science in Nursing, and a three-year program leading to the Diploma in Nursing.

In 1954 at the request of the University Hospital, the diploma program was transferred from the University and placed under the jurisdiction of the University Hospital Board.

Although many revisions in the five-year degree program had taken place since its inception, the clinical portion of the program continued to be offered through affiliation with the University Hospital until 1966 when the four-year integrated program under the direct control of The University of Alberta was implemented.

In 1966, after *The Universities Act* was enacted, the School of Nursing, by action of the General Faculty Council, became an autonomous school.

Until 1970 the School of Nursing offered one-year programs leading to a Diploma in Public Health Nursing and a Diploma in Teaching and Supervision. These pro-

grams were discontinued and replaced by a revised degree program for Registered Nurses.

Since 1943, a five-month program leading to the Certificate in Advanced Practical Obstetrics has been offered. In conjunction with the Faculty of Medicine, a Nurse Practitioner Program funded by the Federal Government, has been offered since 1971.

A Masters in Nursing Program, with the specialty of Nursing in Acute Illness, commenced in 1975.

In 1976, the School was given Faculty status.

131.2.2 AIMS AND OBJECTIVES

The general aim of the Faculty of Nursing is to prepare individuals who possess those competencies and skills to practice professional nursing in a variety of settings to assume dependent, independent and interdependent roles within a multidisciplinary team.

The Faculty's specific objectives are to assist the student in developing the ability to:

(1) Synthesize and apply knowledge of concepts and theories from the physical, social, behavioral sciences, humanities, and nursing in the practice of nursing.

(2) Select and/or utilize supportive technologies in the practice of nursing.

(3) Interact purposefully with a client by utilizing the nursing process.

(4) Provide leadership in promoting and maintaining the health of the client.

(5) Understand the role of the professional nurse in relation to the roles of other members of the multidisciplinary team and respect their reciprocal contributions.

(6) Demonstrate an awareness of societal changes and how they influence professional nursing and the health care system.

(7) Apply the basic principles of research to improve nursing practice, through:

(a) promoting application of findings;

(b) encouraging nursing research efforts;

(c) generating research ideas.

(8) Demonstrate self-directiveness in professional and personal growth.

131.2.3 PROGRAMS FOR BACCALAUREATE DEGREE

(1) *Basic Four Year Program.* The aims of the Basic Four Year Program leading to the degree Bachelor of Science in Nursing are: (a) to prepare men and women to practice nursing in community health agencies, and to assume leadership positions — team leader, assistant head nurse, assistant nursing instructor and staff public health nurse; (b) to provide a foundation for continuing professional growth and for graduate study in nursing.

(2) *Post-R.N. Program.* The aim of the program is to prepare students for positions in community health agencies such as hospitals, voluntary and official health agencies, and schools of nursing. The students will be granted five years from the time of admission to the Nursing courses to complete requirements for the degree. One academic year as a full-time intramural student at The University of Alberta Faculty of Nursing is required.

131.2.4 PROGRAMS FOR MASTER'S DEGREES

(1) *Master's in Nursing Program.* The primary aim of the program is to prepare advanced level clinical practitioners in *Nursing in Acute Illness.* Students are encouraged to pursue a second focus as well (e.g., teaching, research, administration and/or a second discipline such as physiology, anthropology, etc.) The program is two academic years in length; a thesis is required of all students. First preference will be given to nurses who have experience in nursing acutely ill patients and who wish to study on a full-time basis. Nurses holding baccalaureate degrees may obtain application forms by writing the Dean, Faculty of Graduate Studies and Research, The University of Alberta. See § 133.4 below for further details.

(2) *Master's in Health Services Administration Program.* The Division of Health Services Administration of the Faculty of Graduate Studies and Research, offers the degree of Master of Health Services Administration with areas of concentration which include hospital administration and *nursing service administration.* Within each of these areas of concentration, students select one of two foci: Research and Planning, or Administration. Nurses holding baccalaureate degrees and who are interested in majoring in nursing service administration should direct their enquiries to the Dean, Faculty of Graduate Studies and Research, The University of Alberta.

(3) *Other Master's Programs.* Nurses seeking degrees in other disciplines (e.g., Education, Family Studies, Community Development) are encouraged to plan programs which include graduate level courses in Nursing and in Health Services Administration. For information contact Graduate Program Coordinator, Faculty of Nursing and Director, Division of Health Services Administration respectively.

131.2.5 CERTIFICATE PROGRAMS

Program leading to the Certificate in Advanced Practical Obstetrics. A program of instruction and clinical experience for Registered Nurses interested in preparing for positions of responsibility in obstetrical nursing.

Successful completion of this program, or of NURS 451 and 453, will entitle the student to credit for either a full senior option; or NURS 485 and a half senior option in the Post R.N. B.Sc.N. program, subject to the 5 year limit described in 132.2.2(8), i.e., the B.Sc.N. degree must be completed within 5 years of registration in the A.P.O. courses.

Program leading to a Nurse Practitioner Certificate. This is a program of concurrent teaching, clinical and laboratory experience for registered nurses interested in preparing for challenging positions in isolated or semi-isolated communities.

Successful completion of this program at The University of Alberta will entitle the student to credit for NURS 468 in the Post R.N. B.Sc.N. program, subject to the 5 year limit described in 132.2.2(8), i.e., the B.Sc.N. degree must be completed within 5 years of registration in the Nurse Practitioner Certificate program. Presently the enrollment is limited to employees of Health and Welfare Canada as it is entirely funded by the Federal Government.

131.2.6 SPECIAL STUDENTS

Special Students are those who have been permitted to register in one or more courses, but not officially for credit toward a degree or diploma at this or any other institution. Such students may subsequently apply for admission to a degree program and, upon admission, may receive credit in that program for courses successfully completed as a Special Student.

132.1 Admission

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta.

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.) or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building, University of Alberta.

Tuition Deposit: Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

132.1.1 REQUIREMENTS FOR BASIC FOUR-YEAR PROGRAM

The requirements for admission to the Basic Program leading to the degree B.Sc. in Nursing are set out in § 13.1 and 13.14 of the University Regulations and Information for Students Calendar. An overall senior matriculation average of at least 65% is required. Enrolment in the Faculty of Nursing Basic Program is limited. First priority is given to Alberta residents.

Applications from high school students require the completion of ALL the following items by MAY 15.

(a) The University of Alberta Application for Admission form;

(b) References (2).

Applications from transfer students from other University of Alberta faculties and other universities require the completion of ALL the following items by MAY 15.

(a) The University of Alberta Application for Admission or Re-enrolment form;

(b) References (2);

(c) Complete high school and post-secondary records.

To be eligible for admission, a minimum grade point average of 5.0 is required.

Applications from students who have previously been in the program and wish to re-enrol in the faculty require the completion of ALL the following items by MAY 15.

(a) The University of Alberta Application for Re-Enrolment form;

(b) Personal interview;

(c) References (2);

(d) Satisfactory academic achievement (minimum GPA 5.0).

Applications from non-matriculated adults require completion or proof of the following by MAY 15:

(a) The University of Alberta Application for Admission form;

(b) References (2);

(c) Alberta High School Diploma (100 credits) or equivalent;

(d) English 30 and Chemistry 30 or equivalent (50% or better);

(e) Twenty-one years of age or older;

(f) Satisfactory recommendation from the University Student Counselling Services.

If a non-matriculated adult appears to the Admissions Committee to be an appropriate candidate but lacks either English 30 or Chemistry 30 (but not both), such a candidate may be admitted on the provisio that the deficiency be made up no later than the beginning of the second year of the Program.

Note A: Applicants who have been notified of their tentative acceptance in the Basic Degree Program are required to have physical examinations at the University Health Service prior to final acceptance into the program.

Note B: A specified schedule of immunization must be completed prior to commencement of clinical practice in the program.

132.1.2 REQUIREMENTS FOR POST-R.N. PROGRAM

In addition to possessing the academic qualifications specified in § § 13.1 and 13.14 of the University Regulations and Information for Students Calendar, the applicant (1) must be a Registered Nurse from an approved school of nursing, (2) MUST HAVE COMPLETED A FULL UNIVERSITY LEVEL INTRODUCTORY PSYCHOLOGY COURSE, (3) must have a minimum of one year's work experience as a Registered Nurse within the past five years, and (4) must provide evidence of eligibility for registration in the Alberta Association of Registered Nurses, and evidence of active registration or licensure in a Canadian nursing association or college.

Admission may be granted on an individual basis after consultation with Student Counselling Services, to an applicant who does not present the equivalent of Alberta Senior Matriculation, but who presents evi-

dence of professional competence and ability to profit from university study. These applicants will be admitted as Non-Matriculated Adult students.

Admission to the Post-R.N. degree program from another University or Faculty is based upon assessment of previous achievement, on an individual basis, by the Program Admissions and Selections Committee.

Enrolment is limited by quota. Preference is given to Alberta residents with at least one year of graduate nursing experience *and who have submitted applications and all required documentation before May 15th.*

Students who have been admitted to the degree program and who are attending on a full-time basis are given priority for admission to Nursing courses.

Normally, students in the Post R.N. Program are required to take a minimum of two full Nursing courses on the University of Alberta campus.

A specified schedule of immunization must be completed prior to commencement of clinical practice in the program.

132.1.3 REQUIREMENTS FOR SPECIAL STUDENTS WHO ARE REGISTERED NURSES

Normally applicants must be Registered Nurses from an approved school of nursing, and must provide evidence of eligibility for registration in the Alberta Association of Registered Nurses. Applications must be submitted no later than July 1.

132.2 Academic Standings and Graduation

132.2.1 REQUIREMENTS FOR BASIC FOUR YEAR PROGRAM

(1) For promotion, a student is required to pass all courses and attain a minimum grade point average of 4.5 in any year. For graduation, an overall grade point average of 5.0 is required.

(2) A grade of 3 will be allowed for credit only in those courses which are taken as options if the required grade point average for the year has been achieved. Only one grade of 3 in a full year course OR two grades of 3 in half-year courses are permitted in the entire program.*

(3) A minimum grade of 4 is required to receive credit in Nursing courses.

(4) Supplemental examinations are permitted in one full-year course OR in two half-year courses in the entire program. No supplementals will be permitted in Nursing courses.*

(5) Students must complete both theory and practise components of nursing courses in order to receive credit.

(6) A student who is absent more than two clinical days in any one clinical nursing course may be required to make up the lost experience before being allowed to continue in the program.

(7) Any decision regarding a student which has been made through a Faculty of Nursing policy is open to appeal by the student. Students with such problems are advised to first consult with the instructor of the course concerned. A further appeal may be activated by an official letter of appeal from the student to the Dean, Faculty of Nursing, in which case the Faculty of Nursing Appeals Committee will meet to consider the case. Details of appeal procedures at the faculty level are available from the Dean's Office. Students have the right to appeal a Faculty of Nursing Appeals Committee decision to the General Faculties Council Academic Appeals Committee. (See § 16.7 Appeals and Grievances of the University Regulations and Information for Students Calendar).

(8) Credit by special assessment is available in certain courses under specific circumstances. Please see § 14.4 in University Regulations and Information for Students Calendar, and request any further information required from the Faculty of Nursing Student Selections Committee.

(9) Each student is responsible for the completeness and accuracy of his/her registration. He/she is also responsible for adjustments in registration made necessary by supplemental examination results. Particular care should be exercised with regard to prerequisite courses.

*A full-year course is interpreted as a weighting of 6 or more; a half-year course is interpreted as a weighting of less than 6.

NOTE A: Students will be responsible for the costs for travel, room and board for field placements.

NOTE B: Students who fail to satisfactorily complete a Nursing course which is prerequisite to another Nursing course in the program MUST make application for readmission to the program by completing an Application for Re-enrolment form. Such readmission is not to be considered automatic.

NOTE C: Students will be assessed fees for NURS 305, 325 and 464, as these courses are Spring Session offerings.

NOTE D: It is recommended that students purchase specified health assessment equipment (approx. cost $75.00)

NOTE E: Students will be responsible for purchase of uniforms in accordance with N.U.S. specifications.

132.2.2 REQUIREMENTS FOR POST-R.N. PROGRAM

(1) For promotion, a student is required to pass all courses and attain a minimum grade point average of 4.5 in any year. For graduation, an overall grade point average of 5.0 is required.

(2) A grade of 3 will be allowed for credit only in those courses which are taken as options if the required grade point average for the year has been achieved. Only one grade of 3 in a full-year course OR two grades of 3 in half-year courses are permitted in the entire program.*

(3) A minimum grade of 4 is required to receive credit in Nursing courses.

(4) Supplemental examinations are permitted in one full-year course OR in two half-year courses in the entire program. No supplementals will be permitted in Nursing courses.*

(5) Students must complete both theory and practise components of nursing courses in order to receive credit.

(6) Any decision regarding a student which has been made through a Faculty of Nursing policy is open to appeal by the student. Students with such problems are advised to first consult with the instructor of the course concerned. A further appeal may be activated by an official letter of appeal from the student to the Dean, Faculty of Nursing, in which case the Faculty of Nursing Appeals Committee will meet to consider the case. Details of appeal procedures at the faculty level are available from the Dean's Office. Students have the right to appeal a Faculty of Nursing Appeals Committee decision to the General Faculties Council Academic Appeals Committee. (See § 16.7 Appeals and Grievances of the University Regulations and Information for Students Calendar.)

(7) Credit by special assessment is available in certain courses under specific circumstances. Please see § 14.4 in University Regulations and Information for Students Calendar, and request any further information required from the Faculty of Nursing Student Selections Committee.

(8) Students will be granted five years from the time of admission to either Nursing 466, 467, 468, 469, 480, 481, 482 or 485 to complete requirements for the degree.

(9) Each student is responsible for the completeness and accuracy of his/her registration. He/she is also responsible for adjustments in registration made necessary by supplemental examination results. Particular care should be exercised with regard to prerequiste courses.

*A full-year course is interpreted as a weighting of 6 or more; a half-year course is interpreted as a weighting of less than 6.

NOTE A: Students will be responsible for the costs for travel, room and board for field placements.

NOTE B: It is recommended that students purchase health assessment equipment (approx. cost $75.00).

133 PROGRAMS OF STUDY

133.1 B.Sc.N. Four-Year Basic Degree Program

First Year

Winter Session	*Hours*
*Elective	3-0-0, Both terms
Nursing 242	3-2s-0, One term
Nursing 243	3-3c-0, One term
Occupational Therapy 319	3-0-0, One term
Physcial Education 204	3-0-3, One term
Physiology 261	3-0-0, 3-0-3
Psychology 260	3-0-0, One term
Psychology 261	3-0-0, One term
Spring Session	
Nursing 305	3-3c-0, 3 wks.

Second Year

Winter Session	
*Elective	3-0-0, One term
Food and Nutrition 325	3-0-3, One term
Nursing 320	3-8c-0, One term
Nursing 321	3-8c-0, One term
Nursing 333	3-0-0, One term
Nursing 334	3-0-0, One term
Nursing 388	3-2s-0, One term
Psychology 309 or Sociology 313	3-0-1, One term
Sociology 202	3-0-0, Both terms
Spring Session	
Nursing 325	2-6c-0, 3 wks.

Third Year

Winter Session	
*Elective	3-0-0, Both terms
*Elective	3-0-0, One term
Nursing 366	6-12c-0, One term
Nursing 367	6-12c-0, One term
Nursing 381	3-0-0, One term
Nursing 439	3-0-0, One term
Sociology 371 or Family 350	3-0-0, One term
Spring Session	
Nursing 464	2-6c-0, 6 wks.

Fourth Year

Winter Session	
*Elective	3-0-0, Both terms
*Elective	3-0-0, Both terms
Nursing 465	2-8c-0, One term
Nursing 480	3-0-0, One term
Nursing 481	3-4c-0, One term
Nursing 482	3-2c-0, One term
Nursing 483	2-2s-0, One term
Nursing 485	0-2s-6c-0, One term

*Electives must be chosen from:
Humanities (1)
Senior Social Science (1)
Science elective (1)
Senior unspecified elective (1)
Senior Political Science (1/2)
Senior Philosophy OR Religious Studies (1/2)

133.2 The B.Sc.N. Post-R.N. Degree Program

Students taking the Post-R.N. Program curriculum in which nursing courses were taught for the last time in 1979-80 must complete the program no later than Fall Convocation 1983. Such students are encouraged to contact the Faculty of Nursing for assistance in program planning.

Nursing Courses	*Hours*
Nursing 388	2-2-0, One term
*Nursing 439	3-0-0, One term
*Nursing 466	3-2s-0, One term
*Nursing 467	3-4c-0, One term
*Nursing 468	3-4c-0, One term
*Nursing 469	3-4c-0, One term
Nursing 480	3-0-0, One term
Nursing 481	3-4c-0, One term
Nursing 482	3-2s-0, One term
*Nursing 483	2-2s-0, One term
Nursing 485	0-2s-6c-0, One term
Support Courses	*Hours*
Food and Nutrition 325 or 326	3-0-3, One term
*Occupational Therapy 319	3-0-0, One term
*Physiology 261 or 262	3-0-0, Both terms
*Psychology 309 or Sociology 313	3-0-0, One term
Sociology 371 or Family 350	3-0-0, One term
Electives	*Hours*
Science	3-0-0, One term
Senior Elective	3-0-0, Both terms
Senior Philosophy or Religious Studies	3-0-0, One term
Senior Political Science	3-0-0, One term
Senior Social Science	3-0-0, Both terms

**This course is pre- or co-requisite to another. Please see course descriptions for details.*

NOTE A: High enrolment in this program necessitates the subdivision of students into two groups. The order in which students take many of the required courses is dictated by the group in which the individual student is placed. Time to graduation is equal in both groups.

NOTE B: One week of required Community Health fieldwork immediately follows the first year of the program.

NOTE C: A number of courses suitable for transfer to the Post-R.N. B.Sc.N. program are available through (a) Athabasca University, (b) University of Alberta Special Sessions, taught in centres outside Edmonton, and (c) other Alberta universities and colleges.

NOTE D: Another route to the degree involves taking courses at an off-campus site on a part-time basis initially. Please contact the Faculty of Nursing for further information on this aspect of the program.

133.3 The Degree of Master of Nursing

133.3.1 GENERAL INFORMATION

The Faculty of Nursing offers a two- (academic) year program, leading to the degree of Master of Nursing. While at this point in time the primary focus is upon preparing nurses to function as advanced level practitioners in the care of acutely ill patients, two factors should be underlined: (1) that students are encouraged to pursue a second focus of interest, such as teaching, research, or administration and/or a second discipline such as physiology, or social psychology, and (2) that in the future, as Faculty resources permit, applications will be accepted from students who wish to focus on areas other than nursing in acute illness.

All students are required to complete a thesis. Students' programs are substantially tailored to their nursing backgrounds and their career objectives. The intent in program planning is to assist students to pursue special interests through utilizing resources not only within the Faculty of Nursing but within the University as a whole.

The time required to complete the Master's program varies according to the candidate's undergraduate preparation and career experience, and the nature of the research undertaken. Generally, a minimum of two academic years is required.

Information regarding assistantships and other forms of financial assistance will be supplied on request.

General inquiries should be addressed to Graduate Program Co-ordinator, Faculty of Nursing, Clinical Sciences Building, The University of Alberta, Edmonton. Canada.

133.3.2 SAMPLE PROGRAM OF STUDIES

It is underlined that individual student programs vary. For example, most students take a minimum of two electives in their first year, and these are determined on an individual basis. However, most students take the following "core" courses:

(1) *First Year*
Nursing 500-501 (Theory and Research in Nursing)
Nursing 505-506 (Advanced Nursing Trends)
H.S.A. 430-431 (Research)

(2) *Second Year*
H.S.A. 530-531 (or equivalent Advanced Research)
Nursing 550 (Advanced Nursing Trends)
Nursing 560 (Advanced Topics in Acute Illness)
Thesis

133.3.3 ADMISSION REQUIREMENTS

(1) Preference will be given to Alberta residents with experience in nursing the acutely ill;

(2) A baccalaureate degree in Nursing with an average of at least 65% in the work of the final two years;

(3) Submission of the results of a Miller Analogies Test;

(4) A statement from the Coordinator of Graduate Programs in the Faculty of Nursing that the applicant is, in all respects, acceptable to the Faculty.

(5) A specified schedule of immunization must be completed prior to commencement of clinical practice in the program.

133.4 The Certificate in Advanced Practical Obstetrics

Courses

NURS 450. Advanced preparation in the care of the maternity patient.
NURS 451. Nursing care of the high risk mother.
NURS 453. Nursing care of the normal and high risk newborn.

Clinical Experience

(1) Concurrent supervised experience in antepartum, intrapartum and postpartum care of patients and in the care of the normal infant.

(2) Supervised experience in the care of the high risk newborn.

(3) Twelve weeks' terminal observation and supervised clinical experience.

(a) Eight weeks' clinical experience in selected obstetrical experience throughout the Province;

(b) Four weeks' clinical experience in either a high risk maternal or neonatal unit.

Each student must deliver, under medical supervision, a minimum of twenty cases.

To obtain the *Certificate in Advanced Practical Obstetrics* the students will have to complete a *total* of 12 weeks terminal fieldwork. Of this, *a minimum* of 6 weeks will be related to Nursing 450 and *a minimum* of 4 weeks will be in either Care of the High Risk Mother OR Care of the Normal and High Risk Newborn. The additional two weeks may be taken in either Normal or High Risk, depending on the student's future work plans.

134 DETAILS OF COURSES

134.1 General Information

Courses open to students in the Faculty of Nursing are listed here in alphabetical order, whether they are offered by the Faculty of Nursing or by another faculty. Prospective students are referred to other Faculty Calendars for descriptions of a variety of courses they may wish to consider for options in their programs.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full-session course is weighted 6. A single-term course is normally weighted 3. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the research project. Some courses are offered for credit only, and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates labora-

tory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

NOTE: § 134.2—Reserved.

134.3 Family Studies

FAM 350. *The Family in Transition.* ★3 (First Term, 3-0-0). An introduction to the study of the family through the issues which surround the family and marriage in contemporary society. Reference to research studies and to historical data will provide the basis of the course. (FAM 350 and SOC 371 may not both be taken for credit.)

134.4 Foods and Nutrition

FD NU 325. *Introductory Nutrition I.* ★3 (First Term, 3-0-3). A study of carbohydrates, fats and proteins, and the role which minerals and vitamins play in their metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent.

FD NU 326. *Introductory Nutrition I.* ★3 (First Term, 3-0-0). A non-laboratory course in nutrition. Lectures are the same as FD NU 325. Selected reading from the literature will be required. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent. Credit may not be obtained for both FD NU 325 and FD NU 326.

FD NU 327. *Introductory Nutrition II.* ★3 (Second Term, 3-0-3). Emphasis will be on minerals and vitamins; their chemical and physiological roles in metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: FD NU 325.

FD NU 328. *Introductory Nutrition II.* ★3 (Second Term, 3-0-0). A non-laboratory course in nutrition. Lectures are the same as FD NU 327. Selected reading from the literature will be required. Prerequisite: FD NU 325 or 326. Credit may not be obtained for both FD NU 327 and FD NU 328.

134.5 Nursing

134.5.1 COURSES IN THE BASIC PROGRAM

NURS 242. *Introduction to Professional Nursing.* ★4 (First Term, 3-2s-0). Focus is on nursing as a profession and its historical evolution. The self-care framework for nursing to be used throughout the B.Sc.N. program will be introduced. Seminar sessions will provide opportunities for small group work to facilitate socialization into the role of the nurse as practitioner, scholar, and educator.

NURS 243. *Assessment of Universal Self-Care.* ★4 (Second Term, 3-6c-0). Focus is on introduction to assessment of universal self-care of oneself and others. Beginning use of the nursing process and basic assessment technologies will be included. Prerequisite: NURS 242.

NURS 305. *Health Assessment.* ★3 (Spring Session, 3-3c-0). Focus is on the components of the health history and physical examination of well adults, with aging modifications. The course provides a foundation of assessment skills necessary for determining client health status. Prerequisites: NURS 243, P ED 204, PHYSL 261.

NURS 320. *Assisting Dimensions of Nursing I.* ★5 (First Term, 3-8c-0). Development and application of selected methods of assisting clients, including interpersonal skills, with the emphasis on clients' self-care agency. The focus will be on clients with modifications in self-care resulting from maturational and selected situational factors. Prerequisites: NURS 305, PHYSL 261, and P ED 204.

NURS 321. *Assisting Dimensions of Nursing II.* ★5 (Second Term, 3-8c-0). Development and application of selected methods of assisting clients, including interpersonal skills, with the emphasis on clients' self-care agency. The focus will be on clients with modifications in self-care resulting from maturational and selected situational factors. Prerequisite: NURS 320.

NURS 325. *Introduction to Nursing of Individuals with Health Deviations.* ★3 (Spring Session, 2-6c-0). This course emphasizes development of nursing assessment and assisting technologies in relation to clients whose self-care agency is modified by behavioral and organic deviations. The focus of the course is on modifications in client agency which arise from selected organic and behavioral deviations. Prerequisite: NURS 321, 333 and 334.

NURS 333. *Medical Sciences I.* ★3 (First Term, 3-0-0). An introduction to medical sciences through the study of pathological processes. The course will focus on the general principles of disease and disorders that affect the body as a whole. Prerequisites: PHYSL 261, P ED 204.

NURS 334. *Medical Sciences II.* ★3 (Second Term, 3-0-0). An integrated approach to the study of the most commonly occurring organic diseases from birth to senescence. The study will include the epidemiology, pathophysiology, signs and symptoms, special diagnostic measures and treatment modalities. Prerequisite: NURS 333.

NURS 366. *Nursing of Individuals, Families and Small Group I.* ★8 (First Term, 6-12c-0). This course emphasizes increasing complexity in nursing assessment and assisting technologies in relation to indviduals and families whose agency is modified by behavioural and organic deviations. Focus will include families in a variety of developmental stages and where a member has a health deviation. Consideration will be given to small groups as recipients of nursing assistance. Emphasis will be on development of the skills of the nurse as both member and facilitator of a small group. Prerequisite: NURS 325.

NURS 367. *Nursing of Individuals, Families and Small Group II.* ★8 (Second Term, 6-12c-0). This course emphasizes increasing complexity in nursing assessment and assisting technologies in relation to individuals and families whose agency is modified by behavioural and organic deviations. Focus will include families in a variety of developmental stages and where a member has a health deviation. Consideration will be given to small groups as recipients of nursing assistance. Emphasis will be on development of the skills of the nurse as both member and facilitator of a small group. Prerequisite: NURS 366.

NURS 381. *Models for Nursing Practice.* ★3 (Second Term, 3-0-0). This course explores the evolution and application of selected models for nursing practice. Opportunity is provided to compare and contrast these models with the self-care model. Pre or corequisite: NURS 366 and 388.

NURS 388. *Research Perspectives.* ★3 (Second Term, 2-2s-0). An introduction to the process of research through a comparative analytical survey of selected studies exemplifying different theoretical, methodological and analytical approaches. Emphasis will be on the communicability of research, the needs of the research consumer, and the development of skills of critical appraisal. Pre or corequisite: PSYCO 309 or SOC 313 or an approved statistics course.

NURS 439. *Principles of Teaching and Learning for Health Care Professionals.* ★3 (First Term, 3-0-0). A course which will introduce the student to principles of teaching and learning in a self-directed learning atmosphere. Focus will be on individual and group investigation of topics relevant to these principles and to teaching situations in the health care field.

NURS 464. *Nursing of Clients with Health Deviations III.* ★6 (Spring Session, 2-6c-0). This course is a concentrated learning experience in the nursing care of individuals and/or groups with complex behavioral and organic deviations. All nursing systems will be utilized. No other course can be taken concurrently. Prerequisite: NURS 367.

NURS 465. *Professional Dimensions of Nursing.* ★3 (First Term, 2-8c-0). This course will provide opportunities for the student to identify and confront nursing issues while engaged in professional nursing practice. These issues will be examined in light of the contribution of nurse scholars, researchers and practitioners. Pre or corequisite: NURS 381, 388, 439.

NURS 480. *Trends and Issues.* ★3 (First Term, 3-0-0). This course explores trends and issues arising from societal forces which have implications for nursing practice, education and research at provincial, national and international levels. Students will examine significant demographic, political, economic, legal and ethical issues with consideration of scientific and technological change. Requisite: Basic nursing students must take this in fourth year.

NURS 481. *Management of Nursing Systems.* ★4 (Second Term, 3-4c-0). The focus will be on planning for the implementation of nursing systems in collaboration with other members of the health care team. Students will be given an opportunity to develop leadership and co-ordinating skills necessary to function in health care organizations. Prerequisite: NURS 483 or consent of instructor.

NURS 482. *Nursing of Large Groups (Program Planning).* ★4 (Second Term, 3-2s-0). The course will focus on the planning of educational and health delivery programs for large groups. Principles from epidemiology, teaching and learning, research, and trends and issues will be applied in program planning for large groups in any phase of health or illness.

NUR 483. *Management of Human Resources in Health Care Organizations.* ★3 (First Term, 2-2s-0). Overview of organizational theory as applied to the management of human resources and behavior within the health care setting. Emphasis is placed on the applications of an organizational framework that will assist in every day managerial problem-solving.

NURS 485. *Senior Nursing Practicum.* ★3 (Second Term, 0-2s-6c-0). A clinical experience which will provide the student with the opportunity to nurse a client(s) of choice. Throughout the practicum the student will be expected to demonstrate competency in technical skills as well as scholarly behavior. Clients chosen for this in-depth study will be determined by available resources. Requisite: Basic nursing students must take this course in the fourth year.

134.5.2 COURSES FOR REGISTERED NURSES

NURS 388. *Research Perspectives.* ★3 (First Term, 2-2s-0). An introduction to the process of research through a comparative analytical survey of selected studies exemplifying different theoretical, methodological and analytical approaches. Emphasis will be on the communicability of research, the needs of the research consumer, and the development of skills of critical appraisal. Pre or corequisite: PSYCO 309 or SOC 313 or an approved statistics course. Note: NURS 388 and 404 may not both be taken for credit.

NURS 439. *Principles of Teaching and Learning for Health Care Professionals.* ★3 (First Term, 3-0-0). A course which will introduce the student to principles of teaching and learning in a self-directed learning atmosphere. Focus will be on individual and group investigation of topics relevant to these principles and to teaching situations in the health care field.

NURS 453. *Nursing Care of the Normal and High Risk Newborn.* ★3 (First Term, 3-3c-0 and four weeks terminal fieldwork). Application of physiological principles to the nursing care of the newborn, preterm and sick infant. The effect of ongoing psychological and social needs in relations with the mother and father. The management of life-support systems in the care of the immature or sick newborn.

NURS 466. *Self-Care Framework for Nursing.* ★3 (either term, 2-2s-0). The focus will be the historical evolution of nursing frameworks with a major emphasis on the self-care framework for professional nursing practice and comparisons with other nursing frameworks.

NURS 467. *Interpersonal Skills for the Promotion of Self-Care.* ★4 (First Term, 3-4c-0). Emphasis will be on the nurses' use of self and communication for the promotion of self-care. The self-care framework will be applied to the nursing of individuals with either universal or health deviation self-care requirements in a variety of settings. Prerequisite or corequisite: NURS 466.

NURS 468. *Assessment of Self-Care of Individuals.* ★3 (either term, 3-3c-0). The focus is on the health assessment of the well adult, with normal aging modifications. The course provides a beginning foundation of assessment skills and technologies necessary for determining client health status through a health history and physical examination. Prerequisites: NURS 466 and 467. Prerequisites or corequisites: OCCTH 319 and PHYSL 261 or 262.

NURS 469. *Nursing of Families.* ★4 (Second Term, 3-4c-0). Focus will be on the family as the recipient of nursing assistance with consideration given to factors influencing universal and health deviation self-care. Prerequisite: NURS 466, 467. Prerequisite or corequisite: OCCTH 319.

NURS 480. *Trends and Issues.* ★3 (First Term, 3-0-0). This course explores trends and issues arising from societal forces which have implications for nursing practice, education and research at provincial, national and international levels. Students will examine significant demographic, political, economic, legal and ethical issues with consideration of scientific and technological change.

NURS 481. *Management of Nursing Systems.* ★4 (Second Term, 3-4c-0). The focus will be on planning for the implementation of nursing systems in collaboration with other members of the health care team. Students will be given an opportunity to develop leadership and co-ordinating skills necessary to function in health care organizations. Prerequisite: NURS 483 or consent of instructor.

NURS 482. *Nursing of Large Groups (Program Planning).* ★4 (Second Term, 3-2s-0). The course will focus on the planning of educational and health delivery programs for large groups. Principles from epidemiology, teaching and learning, research, and trends and issues will be applied in program planning for large groups in any phase of health or illness. Prerequisites: NURS 439, 466, 467, 468 and 469.

NURS 483. *Management of Human Resources in Health Care Organizations.* ★3 (First Term, 2-2s-0). Overview of organizational theory as applied to the management of human resources and behavior within the health care setting. Emphasis is placed on the applications of an organizational framework that will assist in every day managerial problem-solving.

NURS 485. *Senior Nursing Practicum.* ★3 (First Term, 0-2s-6c-0). A clinical experience which will provide the student with the opportunity to nurse a client(s) of choice. Throughout the practicum the student will be expected to demonstrate competency in technical skills as well as scholarly behavior. Clients chosen for this in-depth study will be determined by available resources. Prerequisites: NURS 439, 466, 467, 468 and 469. Prerequisite or corequisite: PHYSL 261 or 262.

NURS 498. *Special Studies in Nursing.* ★3 (either term, variable).

134.5.3 GRADUATE COURSES

NURS 500. *Theory and Research in Nursing in Acute Illness I.* ★3 (First Term, 3-0-0). Advanced analysis of theories, processes and research in nursing, with special emphasis upon problem solving and the delineation of biological and psychosocial priorities in patient care. Prerequisite: Consent of the instructor.

NURS 501. *Theory and Research in Nursing in Acute Illness II.* ★3 (Second Term, 3-0-0). Advanced problems in nursing acutely ill patients, with special emphasis upon communication and coordination with other health and social services, patients' families, and community resources. Prerequisite: NURS 500 or consent of the instructor.

NURS 505. *Advanced Clinical Nursing I.* ★6 (First Term, 0-2s-6) [The hours cited for this course should be regarded as minimum. Individual students may be required to complete additional clinical practice requirements.] Advanced clinical experience in nursing acutely ill patients with emphasis upon the development of problem-solving skills as they relate to patient care, including comprehensive assessment of patients' nursing care needs. Corequisite: NURS 500.

NURS 506. *Advanced Clinical Nursing II.* ★6 (Second Term, 0-2s-6). [The hours cited for this course should be regarded as minimum. Individual students may be required to complete additional clinical practice requirements.] Advanced clinical experience in meeting the nursing care needs of acutely ill patients, with emphasis upon communication and coordination of

care with other health and social services personnel, patients' families, and community resources. Prerequisite: NURS 505; corequisite: NURS 501.

NURS 550. *Advanced Seminar in Trends in Nursing.* ★2 (First Term, 0-3s-0). Advanced analysis of trends, problems and issues in the field of nursing, with emphasis on its interrelationships with other components of the health care system. Prerequisite: Consent of the instructor.

NURS 560. *Advanced Topics in Acute Care Nursing.* ★3 (either term, 3-0-0). A conference course aimed at developing in-depth knowledge regarding a topic/topics directly or indirectly related to advanced level nursing in the area of acute care. Teaching approach varied to suit learning objectives, and may include the use of such methods as tutorials, clinical experiences, and seminars.

134.5.4 COURSES IN OBSTETRICAL NURSING

NURS 450. *Advanced Nursing Care and Management of the Obstetrical Patient.* ★12 (Both Terms: First Term 6-3s, 6c-0; Second Term 6-8 weeks terminal field [40c] plus concurrent teaching). The supervision and management of pregnancy, parturition and the post-partum period based upon an understanding of the physiological process and an ability to identify deviation from the normal course. The interrelationship of physiology and the mechanisms of labor which occur during labor and delivery. The development of skills in observation, assessment, application, teaching and interpersonal relationships. Lectures, seminars and field experience.

NURS 451. *Nursing Care of the High Risk Mother.* ★3 (First Term, 3-3c-0 and four weeks terminal fieldwork). Nursing care of the mother with an abnormal pregnancy and/or labor based on an understanding of the underlying pathophysiology. Management of mothers who require fetal monitoring during labor. Identification and management of the mother who exhibits a disordered maternal-newborn relationship.

NURS 453. *Nursing Care of the Normal and High Risk Newborn.* ★3 (First Term, 3-3c-0 and four weeks terminal fieldwork). Application of physiological principles to the nursing care of the newborn, preterm and sick infant. The effect of ongoing psychological and social needs in relations with the mother and father. The management of life-support systems in the care of the immature or sick newborn.

134.6 Occupational Therapy

OCCTH 319. *Life Span Development.* ★3 (either term, 2-0-1). The study of the development of the child to maturity, the changing periods of adulthood and the significance of the aging process. Study will include both physical and psychosocial factors as they relate to occupational therapy.

134.7 Physical Education

P ED 204. *Structural Anatomy.* ★3 (First Term, 3-0-3). A regional survey of the human body as relates to the development of human movement. (For B.P.E. and Nursing students only.)

134.8 Physiology

PHYSL 261. *Elementary Physiology.* ★6 (3-0-0, 3-0-3). Available only to students in Faculty of Rehabilitation Medicine, Medical Laboratory Science program in Faculty of Medicine, and Faculty of Nursing.

PHYSL 262. *Elementary Physiology.* ★6 (3-0-0). Available only to students in Faculty of Rehabilitation Medicine and Faculty of Nursing.

134.9 Psychology

Note: Students with credit in Psychology 202, 212 or EDPSY 269/271 may not take PSYCO 260/261 for degree credit.

PSYCO 260. *Basic Psychological Processes.* ★3 (either term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 261. *Individual and Social Behavior.* ★3 (either term, 3-0-0). Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be included. Prerequisite: PSYCO 260.

PSYCO 309. *Statistical Methods for Psychological Research.* ★3 (either term, 3-0-1). Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of sampling theory and tests of statistical hypothesis. Prerequisite: Mathematics 30, MATH 100 or consent of the Department.

For descriptions of further courses in Psychology see § § 44.32 and 184.30 of the Faculties of Arts and Science Calendar.

134.10 Sociology

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture and social ranking schemes. The interrelationships between the various institutions (e.g., family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 313. *Introduction to Statistics.* ★3 (either term, 3-0-1). Introduction to the sociological application of statistics. The logic and interpretation of statistical concepts; measures of central tendency, variability and relationships; sampling and tests of hypotheses. Note: SOC 311 and SOC 313 may not both be taken for credit.

SOC 371. *The Family.* ★3 (either term, 3-0-0). Structure and function of the family system, historically and cross-culturally. The family system in contemporary societies emphasizing its institutional characteristics and current trends. Prerequisite: SOC 202 or 403.

For descriptions of senior courses in Sociology see § 44.39 of the Faculties of Arts and Science Calendar.

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The first graduates of a four year Baccalaureate Degree Program in Pharmacy in the British Empire.

Faculty of Pharmacy and Pharmaceutical Sciences

141 INTRODUCTORY

141.1 Members of the Faculty

141.1.1 OFFICERS OF THE FACULTY

Acting Dean
G. E. MYERS, Ph.D.

Assistant Deans
R. T. COUTTS, Ph.D., D.Sc. (Graduate Studies)
R. E. MOSKALYK, Ph.D. (Undergraduate Education)

Student Admissions and Registrations
R. E. MOSKALYK, Ph.D.

Graduate Student Admissions
R. T. COUTTS, Ph.D., D.Sc.

Continuing Pharmacy Education Committee Members
G. E. MYERS, Ph.D. (Chairman)
B. A. FERBEY, B.Sc.
A. J. D. FRIESEN, Ph.D.
R. A. LOCOCK, Ph.D.
D. E. ZINYK, B.Sc.

Administrative Officer
D. E. ZINYK, B.Sc.

141.1.2 ACADEMIC STAFF

Professor and Acting Dean
G. E. MYERS, Ph.D. (Pharmaceutical Microbiology)

Professors
D. F. BIGGS, Ph.D. (Medicinal Chemistry)
L. G. CHATTEN, Ph.D. (Medicinal Chemistry)
R. T. COUTTS, Ph.D., D.Sc. (Medicinal Chemistry)
E. E. KNAUS, Ph.D. (Medicinal Chemistry)
R. E. MOSKALYK, Ph.D. (Medicinal Chemistry)
A. A. NOUJAIM, Ph.D. (Bionucleonics and Radiopharmacy)
L. G. STEPHENS-NEWSHAM, Ph.D. (Bionucleonics and Radiopharmacy)
L. I. WIEBE, Ph.D. (Bionucleonics and Radiopharmacy)

Associate Professors
A. J. D. FRIESEN, Ph.D. (Pharmacy and Pharmaceutics)
J. W. LEVCHUK, Ph.D. (Pharmacy and Pharmaceutics)
R. A. LOCOCK, Ph.D. (Medicinal Chemistry)
L. A. PAGLIARO, Pharm.D. (Pharmacy and Pharmaceutics)
J. A. ROGERS, Ph.D. (Pharmacy and Pharmaceutics)
A. SHYSH, Ph.D. (Bionucleonics and Radiopharmacy)
M. W. WOLOWYK, Ph.D. (Pharmacy and Pharmaceutics)

Assistant Professors
P. K. NG, Pharm.D. (Pharmacy and Pharmaceutics)
Y. K. TAM, Ph.D. (Pharmacy and Pharmaceutics)

Assistant Clinical Professor
C. LASKOSKI, B.Sc.

Honorary Professors
W. G. DEWHURST, B.M., B.Ch, F.R.C.P.
B. C. LENTLE, M.B., Ch.B., M.D. (Radiopharmacy)

Honorary Assistant Professor
G. B. BAKER, Ph.D.

Honorary Professional Associate
G. R. JONES, Ph.D.

Faculty Service Officers
C. EDISS (Bionucleonics)
S. McQUARRIE (Bionucleonics)

Professional Officers
T. W. KASSIAN, B.Sc.
D. E. ZINYK, B.Sc.

Professional Associates
M. J. APPS, Ph.D. (Research Associate — "Slowpoke")
S. E. HUNT (Radiation Protection)
J. R. SCOTT, M.Sc. (Radiopharmacy)

Sessional Staff
J. M. BAKER, Ph.D. (Assistant Professor, Pharmacy and Pharmaceutics)
W. BODDY, B.Sc. (Lecturer, Pharmacy Administration; Assistant Registrar, A.Ph.A.)
D. M. CAMERON, B.Sc. (Lecturer, Pharmacy Administration; Registrar, A.Ph.A.)
M. K. COTTLE, Ph.D. (Assistant Professor)
H. DIXON, B.Sc. (Lecturer in Hospital Pharmacy)
F. M. PASUTTO, Ph.D. (Assistant Professor, Medicinal Chemistry)
M. A. PETERSON, B.Sc., M.Sc. (Lecturer, Pharmacy and Pharmaceutics)
H. RADCHUK, B.Sc. (Pharm.) (Lecturer, Pharmacy and Pharmaceutics)
R. SAITO, D.V.M. (Lecturer, Veterinary Sciences)

Assistant Clinical Instructors
L. ASSHETON-SMITH, B.Sc.
B. COOK, B.Sc.
L. DAMMEYER, B.Sc.
C. DECHANT, B.Sc.
B. DECORE, B.Sc.
L. DOUCHET, B.Sc.
D. FRIZZELL, B.Sc.
C. GORDICHUK, B.Sc.
J. R. GRYNOCH, M.D.
J. HAIG, B.Sc.
R. C. HEIM, B.Sc.
G. W. HOWATT, B.Sc.
R. JEWETT, B.Sc.
P. J. JIN, B.Sc.
D. KOWALISHIN, B.Sc.
S. KRINKE, B.Sc.
G. J. LAUZON, Ph.D.

M. LONGWORTH, B.Sc.
B. MORRIS, B.Sc.
B. MOUSSA, B.Sc.
E. NASH, B.Sc.
C. NEKOLAICHUK, B.Sc.
B. PENNOYER, B.Sc.
D. RADOMSKY, B.Sc.
E. ROMANOWSKI, M.D.
D. RUSSEL, B.Sc.
A. SAMUELSON, B.Sc.
J. SCOTT, M.Sc.
J. SKUBA, B.Sc.
B. THOMPSON, B.Sc.
C. UGOJI, B.Sc.
A. WALTERS, B.Sc.
C. P. WEPPLER, B.Sc.

Residency Program

J. W. LEVCHUK, Ph.D. (Coordinator)
H. A. DIXON (U of A Hospital)
R. C. HEIM (Foothills Hospital)
C. LASKOSKI (Royal Alexandra Hospital)
P. McORMOND, (Div. Nuclear Med., Foothill Hospital)
J. R. SCOTT (Edmonton Radiopharmaceutical Center)
D. B. THOMPSON (Calgary General Hospital)

141.1.3 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor

M. HOROWITZ, Ed.D.

Dean of the Faculty of Medicine

D. F. CAMERON, M.D., F.R.C.P.(C), F.A.C.A.

Professors

W. A. AYER, Ph.D. (Chemistry)
W. A. BRIDGER, Ph.D. (Biochemistry)
D. D. CASS, Ph.D. (Botany)
W. F. DRYDEN, Ph.D. (Pharmacology)
R. B. STEIN, Ph.D. (Physiology)

Representatives

D. E. HAGEN, B.Sc. (Alberta Pharmaceutical Association)
D. WASARAB, B.Sc. (Graduate Student Representative)
C. BOULET (Undergraduate representative)

Registrar of the University

W. A. BLANCHARD

141.2 Opportunities in Pharmacy

Pharmacy is one of the oldest of the professions. It has progressed from the compounding and dispensing of drugs to essentially a "knowledge system" about drugs and drug products. Pharmacy practice has increasingly become oriented to the patient and accordingly requires the aspiring pharmacist to possess good communication skills and to be aware of and sensitive to the frequent need for compassion and understanding.

A variety of career options are open to the pharmacist upon graduation and licensure.

Community Practice. Community practice provides the "place of practice" for the majority of pharmacists. It can take one of many forms, namely, independently owned, a chain, a unit within a department store or a part of a clinic. It can be large, providing a broad range of products and services; or small, dealing exclusively in medicines and related supplies. In whatever form, the practice environment of community pharmacy is one where the professional activities of the pharmacist, be he owner, manager or employee, involve direct contact with the client seeking either prescription medication or self-medication products or services. In balancing the commercial and professional aspects of community practice pharmacy, the pharmacist remains accountable in ensuring that the patient properly takes only those medicines which are essential for the maintenance of health, the prevention of disease or the rational relief of pain.

Hospital Practice. Hospital pharmacists provide services in complex health care organizations. Traditionally, the pharmacist is responsible for the institutional procurement, preparation, distribution and control of pharmaceuticals. As a member of a health care team, the pharmacist is also responsible for patient-oriented services such as therapeutic consultations, drug information, and patient counselling and education. Some hospital pharmacists find careers by concentrating their practice in specific areas such as management, clinical services, and drug information. Others find rewarding careers as generalists in the country's many smaller to medium-sized institutions.

Pharmaceutical Industry. The pharmaceutical industry has essentially taken over the traditional compounding responsibilities on behalf of the practising pharmacist. By freeing the pharmacist from the time constraints of the compounding of medication, a redirection toward a patient-oriented pharmacy practice has been made possible.

The pharmacist who chooses the pharmaceutical industry as his practice environment identifies with one or more of the distinct parts of the compounding function: discovery or invention, formulation, ensuring safety, ensuring efficacy or the actual manufacture of the drug. However, he may alternatively become involved with the marketing of the product. The most facile point of entry into many companies is via the sales department which is, as well, the area of greatest opportunity for advancement. Opportunities in the other areas are often enhanced for graduates who proceed for post-graduate training in one of the pharmaceutical sciences.

Government Regulatory and Association Pharmacy Services. Career opportunities for pharmacists exist in government ministries, both federal and provincial. These opportunities often relate to inspection and analyst functions in the regulatory sense. Each provincial licensing body is likewise staffed by pharmacists who involve themselves in regulatory activities, being that Pharmacy is a self-policing profession.

Education and Research. Graduates may choose the university as their practice environment. However training to the doctoral level is normally essential, although practising pharmacists in community, hospital association and the pharmaceutical industry contribute to specific educational programs for pharmacy students.

Opportunities in research can be found in universities, government institutions and in private industry. Once again, training to the doctoral level is often essential.

Finally, many pharmacists have found greatly expanded career opportunities by adding to their basic degree in pharmacy, parallel degrees in law, business and engineering.

141.3 Qualifications for Practice in Alberta

The Bachelor of Science degree in Pharmacy of The University of Alberta is the minimum academic requirement accepted by the Alberta Pharmaceutical Association for the licence to practise pharmacy in the Province of Alberta.

In order to register as a pharmacist with the Alberta Pharmaceutical Association a graduate must also have successfully completed an internship program. This internship program, sponsored and operated by the Alberta Pharmaceutical Association, is available to students in their graduating year at The University of Alberta. Information concerning the regulations applying to practical experience in Alberta may be obtained from the registrar-treasurer, Alberta Pharmaceutical Association, 10615-124 Street, Edmonton, Alberta, T5N 1S5.

The regulations governing the practice of Pharmacy in the Province of Alberta are set forth in the Alberta Pharmaceutical Association Act.

142 FACULTY REGULATIONS

142.1 Admission

Admission is based on academic achievement and every effort will be made to accept all applicants who are academically qualified. However, since the number of persons applying is currently in excess of the number that can be accommodated due to limitations of space and other facilities, priority is given to students who are Canadian citizens or Permanent Residents (Landed Immigrants) who are residents of Alberta. A limited number of highly qualified students who reside in other parts of Canada are also accepted annually, as are a smaller number of highly qualified foreign (student visa) applicants.

The admission requirements of the Faculty of Pharmacy and Pharmaceutical Sciences are set out in § § 13.1 and 13.14 of the University Regulations and Information for Students Calendar. The prospective student must submit PCAT (Pharmacy College Admission Test) scores with the application for admission. PCAT application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Room 123, Administration Building (Tel. 432-5221), or from The Psychological Corporation, 304 East 45th Street, New York, New York, 10017, U.S.A. In addition, the prospective student must submit a statement with his/her application for admission, in which the student's reasons for seeking admission to the Faculty of Pharmacy and special career goals in pharmacy are set forth.

Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

a. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

b. Applicants presenting a TOEFL score of less than 600 but 550 or greater will usually be considered as having a minor deficiency. Subject to the requirements of the particular Faculties, such an applicant may be granted provisional admission into the University but will be required to successfully complete one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in his or her regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated (as in (a) above).

c. An applicant presenting a TOEFL score of less than 550 will be considered as having a major deficiency in the language of instruction and will not be admitted into The University of Alberta until proficiency can be demonstrated.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms

may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

142.2 Academic Standing

Academic performance is normally measured by Grade Point Average* (G.P.A.) attained during the academic year. In this determination, grades of W are ignored throughout, grades of ABF or INF are considered to be grades of 1.

Determination of each student's academic performance will normally occur after the end of the regular academic year, on the basis of the work attempted during that year.

Promotion of the student from year to year is contingent upon satisfactory academic performance.

Satisfactory performance is defined as that which yields a Grade Point Average of 5.0 or more.

Probationary performance is that which yields a Grade Point Average of less than 5.0 but not less than 4.5. In order to be allowed to continue in the program, the probationary student must attain a G.P.A. in his subsequent year's work sufficient to bring his overall cumulative G.P.A. to at least 5.0.

Unsatisfactory performance is that which yields a Grade Point Average of less than 4.5.

Supplemental privileges. Students whose performance is satisfactory or probationary may normally write supplemental examinations (when available) provided their Quality Index** (Q.I.) is at least 70% of the Grade Point Average. If it is less than 70%, the student will normally be allowed to repeat failed courses.

Students whose performance is unsatisfactory may normally only be eligible for supplementals if their Grade Point Average is at least 4.3 and the Quality Index is at least 70% of the G.P.A. Students whose G.P.A. is at least 4.3 but whose Q.I. is less than 70% of the Grade Point Average will normally be allowed to repeat failed courses.

Required to withdraw. Students with Grade Point Averages below 4.3 will not be allowed to continue in the faculty.

Graduation. In order to qualify for graduation the student must satisfy all degree requirements as specified in 143.1 below and present an overall cumulative Grade Point Average of at least 5.0. This cumulative G.P.A. is to be calculated using only those grades obtained in courses taken as a part of the degree program (see §143.1.3). It does not include grades obtained in courses taken as extra to the program nor does it include those in courses accepted for transfer credit.

The additional requirement of a satisfactory performance in a comprehensive examination, to be taken upon completion of the course requirements, is presently under consideration.

First Class Standing is awarded to each student who achieves a Grade Point Average of at least 7.5 during a winter session, provided he has taken at least four full or eight half courses in that session.

The notation *with distinction* is inscribed on the permanent record and graduate parchment if the candidate has obtained a Grade Point Average of 7.5 or higher, averaged over the last two years of his program.

$$*\text{G.P.A.} = \frac{\text{Sum of (Grade X Course Weight)}}{\text{Sum of Course Weights}}$$

$$**\text{Q.I.} = \frac{\text{Sum of Course Weights Passed}}{\text{Sum of Course Weights Attempted}} \times \text{G.P.A.}$$

Appeals and Grievances Decisions on academic standing are made by the Council of the Faculty. Appeals may be made to the G.F.C. Academic Appeals Committee. Enquiries concerning standing in individual courses should be made to the professor in charge of the course. If the issue is still not resolved the student may report the matter to the Dean for enquiry. See § 16.7 (Appeals and Grievances) of the University Regulations and Information for Students Calendar for further information.

143 PROGRAMS OF STUDY

143.1 The Degree of Bachelor of Science in Pharmacy

143.1.1 GENERAL INFORMATION

The first degree program in Pharmacy is four years in length.

The courses to be taken in the first three years of the program are essentially fixed and are considered basic to the training of an undifferentiated pharmacist. The fourth year has three required half courses to round out the core program. The remainder of the fourth year course load allows for some degree of specialization to better prepare the student for his contemplated career in Pharmacy. Accordingly, the student must select courses from one of three areas of specialization, namely, *community practice, hospital practice* or *industrial, government or university practice.* Normally, no more than one half course outside of the specialty area will be approved in the student's program.

Pre-registration. All students will be required to pre-register into the subsequent year's program prior to completion of the current year's work. Election of a specialty area must be made at this time by the student who is pre-registering for his final year in the program.

143.1.2 TRANSFER FROM OTHER FACULTIES OR INSTITUTIONS

Students wishing to study at another institution in Alberta with the intent of transferring to Pharmacy are advised to consult the calendar of that institution regarding an appropriate pre-Pharmacy program.

143.1.3 PROGRAM OF COURSES

First Year	*First Term Hours*	*Second Term Hours*
BIOL 297 (Heredity)	3-0-3 or	3-0-3
MATH 240 (Algebra and Elementary Calculus)	4-0-0 or	4-0-0
CHEM 200 (Chemistry)	3-1s-3	3-1s-3
CHEM 250 (Organic Chemistry)	3-0-3	3-0-3
PHARM 210 (Introductory Pharmacy)	3-0-3	3-0-3
ENGL 210 (English) or an approved Arts Option	3-0-0	3-0-0

Second Year

MICRB 315 (General Microbiology I)	3-0-3	—
PHARM 310 (Physical Pharmacy)	3-0-3	3-0-3
PHARM 320 (Introduction to Medicinal Chemistry)	3-0-0	3-0-0
PHARM 331 (Antimicrobial Drugs)	—	3-0-3
PHYSL 452 (Physiology)	3-0-0	3-0-3
ANAT 300 (Human Morphology)	—	3-0-0
PHARM 330 (Introduction to Disease Processes)	—	2-0-0
PHARM 325 (Introduction to Quantitative Pharmaceutical Analysis)	2-0-4	—

Third Year

BIOCH 300 (Biochemistry)	3-0-3	3-0-3
PMCOL 431 (Pharmacology)	3-0-3	3-0-3
PHARM 410 (Dispensing Pharmacy)	3-0-3	3-0-3
PHARM 421 (Biopharmaceutical Chemistry)	3-0-0	—
PHARM 420 (Medicinal Chemistry)	3-0-0	3-0-0
An approved Science option*	3-0-2	3-0-2

*A list of approved Science options will be made available to students prior to pre-registration. (The approved course or courses must total at least eight (8) credit units as defined below).

Fourth Year

All students must register in Pharmacy 487, 488 and 490 and elect additional courses such that the total of the course credit units is at least 39. Of the 39 credit units required to complete the fourth year, at least 30 must be derived from Pharmacy courses.

The course credit unit is calculated by adding the lecture hours per term (half year) and half the laboratory and seminar hours per term. For a course with three hours of lectures per week in each term, the course credit units would be 6. In the case of a course with three hours of lectures per week, and three hours of laboratory work per week in each term, the course credit units would be 9.

Those students who have selected a career in *community* practice are strongly advised to also register in Pharmacy 464, Pharmacy 492 and Pharmacy 494 and are required to select additional courses from the following list:

Pharmacy 463	Pharmacy 498
Pharmacy 465	Pharmacy 554
Pharmacy 473	Pharmacy 555
Pharmacy 481	Pharmacy 561
Pharmacy 484	Pharmacy 586

and other approved courses from the Faculty of Business Administration and Commerce.

Those students who have selected a career in *hospital practice* are strongly advised to also register in Pharmacy 464, Pharmacy 560, Pharmacy 561, Pharmacy 562, and Pharmacy 563, and are required to select additional courses from the following list:

Pharmacy 425	Pharmacy 485
Pharmacy 427	Pharmacy 498
Pharmacy 450	Pharmacy 551
Pharmacy 454	Pharmacy 554
Pharmacy 455	Pharmacy 555
Pharmacy 463	Pharmacy 570
Pharmacy 465	Pharmacy 571
Pharmacy 473	Pharmacy 572
Pharmacy 484	Pharmacy 586

and other approved courses, from the Faculties of Arts and Science.

Those students who have selected a career in *industry or government laboratories, or* who are planning to undertake *graduate studies*, are strongly advised to also register in one or more of Pharmacy 570, Pharmacy 571 and Pharmacy 572 and are required to select additional courses from the following list:

Pharmacy 425	Pharmacy 485
Pharmacy 427	Pharmacy 498
Pharmacy 450	Pharmacy 499
Pharmacy 454	Pharmacy 551
Pharmacy 455	Pharmacy 554
Pharmacy 463	Pharmacy 555
Pharmacy 465	Pharmacy 561
Pharmacy 473	Pharmacy 586
Pharmacy 484	

and other approved courses from the Faculty of Science.

It may be necessary to limit enrolment in certain optional fourth year Pharmacy courses.

143.2 Graduate Study

Students may undertake graduate study in pharmacy leading to the degree of M.Pharm., M.Sc. or Ph.D. Any students contemplating such work should discuss their program with the Dean of the Faculty of Pharmacy and Pharmaceutical Sciences. They should also familiarize themselves with the admission requirements, regulations and procedures laid down by the Faculty of Graduate Studies and Research. These may be found in § 204.61 of the Faculty of Graduate Studies and Research Calendar.

The Degree of M.Pharm.

A two year program combining academic course work, professional experience and research investigation leading to the degree of Master of Pharmacy in various professional areas (e.g., Clinical Pharmacy, Drug Information, Hospital Practice, etc.) is offered to acceptable students holding a B.Sc. degree in Pharmacy. The first academic term is devoted primarily to course work in the biological and health sciences. The professional portion of the program consists of research and study in a professional environment leading to the submission of an acceptable thesis.

The Degree of M.Sc. and Ph.D.

The Faculty of Pharmacy and Pharmaceutical Sciences offers programs leading to the Master of Science and Doctor of Philosophy degrees and can accommodate a limited number of graduate students in modern well-equipped laboratories.

Research may be undertaken in fields such as Pharmaceutics, Biopharmaceutics, Physical Pharmacy, Bionucleonics, Radiopharmacy, Medicinal Chemistry, Pharmaceutical Chemistry, Drug Analysis, Drug Metabolism, Microbiology, Pharmacology, Hospital Pharmacy, Clinical Pharmacy.

Individuals with previous degrees in such fields as Pharmacy, Biology, or Chemistry will be considered.

Financial assistance is available from the Canadian Foundation for the Advancement of Pharmacy, and from other sources.

Prospective candidates should consult with the Dean regarding the requirements.

Students planning to begin graduate work should make application for admission to the Faculty of Graduate Studies and Research. Applications should be addressed to the Dean, Faculty of Graduate Studies and Research.

144.1 General Information

Courses open to students in the Faculty of Pharmacy and Pharmaceutical Sciences are listed here in alphabetical order, whether they are offered by that faculty or by another faculty.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★" standing for "course weight" (not to be confused with course credit unit (see §143.1,3. — Fourth Year)), and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full-session course is weighted 6. A single-term course is normally weighted 3. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the research project. Some courses are offered for credit only, and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

144.2 Anatomy

ANAT 300. *Human Morphology.* ★3 (Second Term, 3-0-0). This course is available only to pharmacy students.

144.3 Biochemistry

BIOCH 300. *General Biochemistry.* ★6 (3-0-3). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins, and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and CHEM 250.

144.4 Biology

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30.

144.5 Chemistry

CHEM 200. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: CHEM 100, or Chemistry 30, or equivalent. Students with credit in CHEM 250 will proceed to CHEM 302.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (e.g., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: CHEM 100, or Chemistry 30 or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Exceptions to this may be made only if written consent of the Department is obtained.

144.6 English

ENGL 210. *English Literary Forms.* ★6 (3-0-0). This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

144.7 Mathematics

MATH 240. *Algebra and Elementary Calculus I.* ★3 (either term, 4-0-0). Differential and integral calculus of algebraic, exponential and logarithmic functions, with applications to problems in business and economics. Prerequisite: Mathematics 30 or equivalent. Note: This course is intended primarily for students registered in the Faculties of Business Administration and Commerce, Agriculture and Forestry, and Pharmacy. Students who have taken Mathematics 31 should take MATH 242.

MATH 242. *Algebra and Elementary Calculus I.* ★3 (either term, 3-0-0). This course covers the same material as MATH 240. Prerequisites: Mathematics 30 and Mathematics 31 or equivalent.

144.8 Microbiology

MICRB 315. *General Microbiology I.* ★3 (either term, 3-0-3). The organization, morphology and cell structure of microorganisms with emphasis on bacteria and fungi. Microbial growth and its control, aspects of medical and applied microbiology and microbial ecology will be discussed. Laboratory exercises are designed to demonstrate basic microbiological techniques as well as relevant microbial activities and functions.

144.9 Pharmacology

PMCOL 431. *General Pharmacology.* ★6 (3-0-3). The pharmacological action of drugs selected for their physiological and clinical significance. Basic pharmacological principles; mechanisms of actions of drugs in neuro-pharmcology and in the control of autocoid substances; drugs used in modifying endocrine function; anti-inflammatory drugs; the diuretics; cardiovascular drugs; haematological agents; gastrointestinal drugs; respiratory drugs and cancer chemotherapeutic agents. Laboratory exercises are designed to establish a sound methodical approach to the assessment of drug action, and a literature search project pro-

vides experience in using a library to obtain information in depth on drug action. Prerequisite: PHYSL 452 or equivalent. Corequisite: BIOCH 300.

144.10 Pharmacy

144.10.1 UNDERGRADUATE COURSES

PHARM 210. *Introductory Pharmacy.* ★6 (3-0-3). Orientation to pharmacy as a profession, pharmaceutical calculations, literature and terminology. Theoretical and practical considerations of pharmaceutical solutions. Principles of physical pharmacy. Laboratory exercises are intended to demonstrate basic communication skills, principles of physical pharmacy and techniques for the compounding and dispensing of certain solution dosage forms. (Restricted to Pharmacy students.)

PHARM 310. *Physical Pharmacy.* ★6 (3-0-3). The application of physical laws to pharmaceutical systems. Theoretical and practical considerations of the physicochemical behavior of dosage forms including solid dosage forms, colloids, suspensions, emulsions, semisolids, novel pharmaceutical dosage forms and the stability of drugs and dosage forms. Laboratory exercises are designed to demonstrate various physical pharmacy principles of dosage forms and to obtain an appreciation of factors involved in the compounding of the common dosage forms. Prerequisite: PHARM 210. (Restricted to Pharmacy students.)

PHARM 320. *Introduction to Medicinal Chemistry.* ★6 (3-0-0). The development of drugs. Physicochemical properties and biologic activity. The relationship of these properties to the absorption, distribution and elimination of drugs. The metabolism of drugs — enzymes, pathways, mechanisms and substrates. Drug receptor interactions and receptor site theory. Prerequisites: CHEM 200 and CHEM 250; Corequisite: PHYSL 452. (Restricted to Pharmacy students.)

PHARM 325. *Introduction to Quantitative Pharmaceutical Analysis.* ★3 (First Term, 2-0-4). Classical chemical methods of quantitative analysis. The laboratory exercises consist mainly of non-instrumental pharmacopoeial techniques that are widely employed in the analysis of pharmaceuticals. Prerequisites: CHEM 200 and 250. (Restricted to Pharmacy students.)

PHARM 330. *Introduction to Disease Processes.* ★2 (Second Term, 2-0-0). The nature of disease, causes, processes, effects and associated alterations in structure and function. Prerequisite or Corequisite: ANAT 300 and PHYSL 452. (Restricted to Pharmacy students.)

PHARM 331. *Antimicrobial Drugs.* ★3 (Second Term, 3-0-3). The use and mode of action of local and systemic antimicrobial drugs. Laboratory: Microbiological and other methods for screening and evaluating antimicrobial drugs. Prerequisite: MICRB 315 or consent of the Faculty. (Restricted to Pharmacy students.)

PHARM 410. *Dispensing Pharmacy.* ★6 (3-0-3). Presentation of the principles underlying the compounding and dispensing of products and items of a prescription department. Introduction to Federal and Provincial legislation pertaining to the control of drugs. Discussion of those aspects of biopharmaceutics and pharmacokinetics which relate to patient counselling and appropriate drug administration. Presentation of OTC product information. Laboratory designed to simulate realistic situations that occur in the practice of pharmacy and to develop professional competence in handling prescriptions. Prerequisite or corequisite: PHARM 310 and PMCOL 431. (Restricted to Pharmacy students.)

PHARM 420. *Medicinal Chemistry.* ★6 (3-0-0). The study of organic medicinal substances including inorganic medicinals. The synthesis, physical-chemical properties, mechanism of action, metabolism and structure-activity relationships of drug classes are discussed. Prerequisite: PHARM 320. (Restricted to Pharmacy students.)

PHARM 421. *Biopharmaceutical Chemistry.* ★3 (First Term, 3-0-0). The study of substances of natural origin of importance in pharmacy and medicine. Corequisite: BIOCH 300. (Restricted to Pharmacy students.)

PHARM 425. *Quantitative Pharmaceutical Analysis.* ★3 (Second Term, 2-0-4). Introduction to instrumental quantitative analysis. The laboratory exercises are designed to familiarize the student with instrumental techniques (visible and U.V. Spectrophotometry, Fluorimetry and Polarimetry) currently used in drug analysis. Prerequisite: PHARM 325 or consent of the Faculty.

PHARM 427. *Qualitative Analysis of Organic Medicinals.* ★3 (First Term, 2-0-4). The identification of organic medicinal compounds, emphasizing the relationships of structure, functional groups and physicochemical properties. Prerequisites: CHEM 200 and 250, PHARM 320.

PHARM 450. *Introduction to Radiopharmacy.* ★3 (First Term, 3-0-2). Basic principles of radioactivity and utility of radiopharmaceuticals for diagnosis and therapy. Fundamental design and operation of various radiation detection instruments as pertaining to radiopharmacy and nuclear medicine. Laboratory: Application of radiation detection to radiopharmacy. Prerequisite: Consent of the Faculty.

PHARM 454. *Isotopes in Nuclear Medicine.* ★3 (Second Term, 3-0-0). Application of radionuclides in medical diagnosis and treatment; control of radionuclides in the hospital; radiation hazards. Prerequisite: PHARM 450 or PHARM 601 or consent of the Faculty.

PHARM 455. *Experiments in Nuclear Medicine.* ★2 (Second Term, 0-1s-2). Selected experiments in nuclear medicine with emphasis on clinical tests with radionuclides and, in particular, radioimmunoassay. Prerequisites: PHARM 450 or PHARM 601 or consent of the Faculty.

PHARM 463. *Pharmaceutical Toxicology I.* ★3 (First Term, 3-0-0). Topics considered include poisoning and its emergency treatment; toxicity of common drugs, household products, vitamins and food additives; toxicology of antimicrobial therapy; undesirable physiological and biochemical effects of commonly used drugs, pathological changes resulting from drug toxicity and mechanisms of toxic reactions; genetics and toxicology. Prerequisite: PMCOL 431 or consent of the Faculty.

PHARM 464. *Clinical Pharmacy.* ★3 (either term, 2-0-4). This course is designed to expose the student to the expanded clinical role of the pharmacist. The lectures and laboratory are designed to involve the student in inter and intraprofessional relations. As well the student participates in patient consultation including techniques for obtaining medication histories, discussion of drug therapy and counselling the patient regarding the proper home use of prescribed and over-the-counter medications and devices. Additionally, an introduction to drug information, drug literature evaluation, clinical laboratory medicine, adverse drug reactions, applied pharmacokinetics and drug interactions is presented. It is intended that the course facilitate the application of information to an individual patient. Prerequisite: PHARM 410.

PHARM 465. *Biopharmaceutics and Clinical Pharmacokinetics.* ★3 (Second Term, 3-0-3). A comprehensive course dealing with basic pharmacokinetic principles on dosage regimen estimation and pharmacokinetic considerations affecting the use of various drugs. Introduction to quantitative treatment of dynamics of drug absorption, distribution, metabolism, and excretion including development of mathematical models for these processes. Clinical pharmacokinetics and pharmacodynamics of commonly used drugs will be covered in detail. Laboratory exercises include computer simulated blood level curves of multiple dosing of various drugs and pharmacokinetic dosing of drugs by means of computer programs. Prerequisites: PHARM 410 and PMCOL 431 or consent of the Faculty.

PHARM 473. *Selected Topics in Medicinal Chemistry.* ★3 (Second Term, 3-0-0). Recent developments and probable future trends in selected areas of medicinal chemistry. Prerequisites: PHARM 420 and PMCOL 431 or consent of the Faculty.

PHARM 481. *Veterinary Science.* ★3 (Second Term, 3-0-0). A course in the commonly used veterinary biological and pharmaceutical preparations; general sanitary and management procedures for the prevention and control of livestock diseases; a brief review of infectious diseases and animal parasites.

PHARM 484. *Biological Products.* ★3 (First Term, 3-0-0). Manufacture, control, licensing, and rationale of the use of biological and microbiological products (immunizing and diagnostic agents, antibiotics and other biological and microbiological products). Prerequisite: MICRB 315 or consent of the Faculty.

PHARM 485. *Analytical Methods for Biological Products.* ★2 (First Term, 1-0-2). Microbiological assays, biological tests

and other methods for the assay, standardization and control of biological and microbiological products of pharmaceutical importance.

PHARM 487. *Pharmaceutical Therapeutics I.* ★3 (Second Term, 3-1s-2). A functional approach to the study of disease states. The role of drugs in therapeutics. Common problems associated with the use of drugs in the disease state. The role of the pharmacist in therapeutics. Areas covered include the therapy of the arthritides, chemotherapy, the use of drugs in psychiatry, etc. Prerequisite: PHARM 410 and PMCOL 431. (Restricted to Pharmacy students.)

PHARM 488. *Pharmaceutical Therapeutics II.* ★3 (First Term, 3-1s-2). A functional approach to the study of disease states. The role of drugs in therapeutics. Common problems associated with the use of drugs in the disease state. The role of the pharmacist in therapeutics. Areas covered include the therapy of diseases of the cardiovascular system, the genito-urinary tract, etc. Prerequisite: PHARM 410 and PMCOL 431. (Restricted to Pharmacy students.)

PHARM 490. *Pharmaceutical Jurisprudence.* ★3 (First Term, 3-0-0). History, provincial and federal legislation and recent developments in the field of pharmacy. (Restricted to Pharmacy students).

PHARM 492. *Pharmacy Management I.* ★3 (First Term, 3-0-0). Managerial responsibilities and processes for the provision of pharmaceutical services and the design and operation of community and institutional pharmacies. Emphasis is on planning and decision-making; procurement and allocation of resources; financial, materials, space and risk management.

PHARM 494. *Pharmacy Management II.* ★3 (Second Term, 3-0-0). Continuation of PHARM 492, with emphasis on quality assurance, the management of human resources, and strategies for organizational change. Prerequisite: PHARM 492 or consent of the Faculty.

PHARM 498. *Pharmaceutical Research.* ★2 (either term, 0-0-4). Investigational work under the direction of a member of the faculty. Preparation of a written report. Prerequisite: Consent of the Faculty and the approval of a Faculty member to direct the research. This course may be taken during the Spring or Summer Sessions by special arrangement. Credit cannot be obtained for both PHARM 498 and PHARM 499.

PHARM 499. *Pharmaceutical Research.* ★4 (0-0-4). Investigational work under the direction of a member of the faculty. Preparation of a written report. Prerequisite: Consent of the Faculty and the approval of a Faculty member to direct the research. This course may be taken during the Spring or Summer Sessions by special arrangement. Credit cannot be obtained for both PHARM 498 and PHARM 499.

PHARM 522. *Phytochemistry.* ★3 (First Term, 3-0-0). The biosynthetic pathways and the chemotaxonomic relationships of alkaloids, flavenoids, steroids, terpenoids and related secondary products of natural origin of importance in pharmacy. Prerequisite: Consent of the Faculty. Note: Offered alternate years. Not offered in 1981-82.

PHARM 551. *Clinical Radiopharmacy Laboratory.* ★3 (Second Term, 1-0-4). A series of laboratory experiments with appropriate introductory lectures designed to acquaint the student with the preparation and quality control of currently used radio-pharmaceuticals in nuclear medicine. Prerequisite: PHARM 450 or PHARM 601 or consent of the Faculty.

PHARM 554. *Radiation Biology.* ★3 (either term, 3-0-0). Biological effects of ionizing radiations on molecules, cells and whole body systems from the physical, biochemical and clinic viewpoint. Prerequisite: Consent of the Faculty. Background courses in physics and chemistry recommended.

PHARM 555. *Experiments in Radiation Biology.* ★2 (either term, 0-1s-2). Selected experiments done in depth, on effects of ionizing radiation on biochemical, biological and animal materials. Prerequisite: PHARM 554 or consent of the Faculty.

PHARM 560. *Sterile Products I.* ★3 (First Term, 3-0-3/2). Theory and application of principles involved in the formulation, preparation, and packaging of sterile dosage forms. Sterile technique, procedural and environmental standards, and quality control are stressed. Prerequisite: PHARM 310 or consent of the Faculty.

PHARM 561. *Pharmaceutical Technology.* ★3 (First Term, 2-0-3). The principles and processes relating to the formulation, preparation and evaluation of selected dosage forms. Emphasis is placed on the laboratory exercises with particular reference to hospital pharmacy practice but includes a component relevant to the manufacturing of sizeable quantities of a dosage form. Prerequisite: Consent of the Faculty.

PHARM 562. *Hospital Pharmacy.* ★3 (First Term, 3-2s-0). Current literature analysis and presentation of modern concepts in drug distribution, drug information systems, application of data processing to decentralized pharmacy services and administrative principles peculiar to institutional pharmacy.

PHARM 563. *Sterile Products II.* ★3 (Second Term, 3-0-3/2). The design and provision of a comprehensive I.V. admixture service, the technology of I.V. admixtures, and the hospital pharmacist's therapeutic responsibilities for large volume parenterals. Prerequisite: PHARM 560 or consent of the Faculty.

PHARM 570. *Advanced Pharmaceutical Analysis — Spectroscopy.* ★3 (First Term, 3-0-4). Applications of instrumental methods of analysis (ultraviolet and infrared spectroscopy; N.M.R.; mass spectrometry; atomic absorption spectroscopy) to pharmaceutical compounds. Prerequisite: PHARM 425 or consent of the Faculty.

PHARM 571. *Advanced Pharmaceutical Analysis — Electroanalytical Techniques.* ★3 (Second Term, 3-0-4). Theory and application of various polarographic techniques, amperometry, conductimetry and potentiometry to pharmaceutical analysis. Prerequisites: PHARM 425 or PHARM 570 or consent of the Faculty.

PHARM 572. *Advanced Pharmaceutical Analysis —Analytical Techniques in Forensic Toxicology and Drug Metabolism.* ★3 (Second Term, 3-0-4). Application of chromatography (thin-layer, ion-exchange, gas-liquid, high-pressure liquid, gel filtration, and affinity chromatography) to the identification and quantitation of drug metabolites and toxic substances. Use of optical and thermal microscopy in pharmaceutical analysis. Prerequisite: PHARM 570 or consent of the Faculty.

PHARM 586. *Pharmaceutical Toxicology II.* ★3 (Second Term, 3-0-3). A mechanistic and forensic approach to the study of toxicology. The use of advanced physical and chemical techniques, and electron microscopy in toxicology. Prerequisite: PMCOL 431 or consent of the Faculty.

144.10.2 GRADUATE COURSES

PHARM 601. *Isotope Tracer Methodology I.* ★3 (First Term, 3-0-3). Fundamental principles of radioactivity and health physics. The importance of radioisotopes in medicine, agriculture, industry, and research. Problems and limitations in the use of radioisotopes as tracers. Instrumentation and analysis methods. Experimental procedures, application of methods of analysis and criteria for evaluation of results. Laboratory: handling and preparation of radioisotopes for counting. Counting procedures. Tracer chemical and biochemical analyses.

PHARM 603. *Activation Analysis.* ★3 (Second Term, 2-0-0). Physical and chemical basis of activation analysis, use of slow neutrons from the Slowpoke reactor, proton and charged particle activation; x-ray fluorescence; modern pulse-height analysis technique. Prerequisite: Consent of the Faculty.

PHARM 604. *Applied Problems in Current Research.* ★3 (either term, 0-0-3). The student will work with one or two faculty members on special research techniques in bionucleonics or radiopharmacy. Experiments will be done in dept. Prerequisite: Consent of the Faculty.

PHARM 605. *Radiopharmaceutical Chemistry.* ★2 (Second Term, 2-0-0). A discussion of preparation of short-lived radiopharmaceuticals with emphasis on radiochemic synthesis using carbon-11, fluorine 18 and radionuclides of iodine and bromine; stability, storage and purity of radio-labelled compounds; labelling with long-lived radionuclides. Prerequisite: Consent of the Faculty.

PHARM 606. *Current Topics in Bionucleonics and Radiopharmacy.* ★3 (either term, 3-0-0). Assigned reading, tutorials and seminars in recent advances in the fields of Bionucleonics and Radiopharmacy, conducted under the direction of several faculty members. Prerequisites: PHARM 551, 601, 603, 604 or consent of the Faculty.

PHARM 610. *Advanced Physical Pharmacy.* ★3 (First Term, 3-0-4). Special topics of a physical chemical nature applicable to pharmaceutical systems, with emphasis on physical and physicochemical properties of drug molecules, surface phenomena, solubility phenomena and the influence of surface activity of drugs on their physical and biological behavi

Laboratory: experimental work in application of physicochemical principles to pharmaceutical systems. Prerequisite: MATH 240 or consent of the Faculty.

PHARM 611. *Pharmaceutical Formulation and Development.* ★3 (Second Term, 3-0-4). Theoretical considerations basic to the technology of pharmaceutical dosage forms to meet the requirements of therapeutic efficacy, stability, and safety. Laboratory: development and formulation of pharmaceutical products. Prerequisites: PHARM 560 and 561 or consent of the Faculty.

PHARM 620. *Structure — Action Relationship of Organic Medicinals.* ★3 (First Term, 3-0-0). Topics in the relationship between chemical structure and biological action of organic medicinal agents. Note: Offered alternate years.

PHARM 623. *Medicinal Macromolecules.* ★3 (Second Term, 3-0-0). The degradative and synthetic chemistry of more complex medicinal compounds. Their properties, especially physical properties as related to their pharmaceutical use. Medicinal polysaccharides (e.g., starch, cellulose and its derivatives, acacia, heparin), medicinal polypeptides and antibiotics (e.g., penicillins, streptomycin, tetracyclines) are studied. Prerequisite: Consent of the Faculty. Note: Offered alternate years.

PHARM 624. *Application of Nuclear Magnetic Resonance Spectroscopy to Medicinal and Pharmaceutical Chemistry.* ★3 (First Term, 3-0-0). Basic interpretation and examples of use of N.M.R. spectroscopy in problems of pharmaceutical synthesis and its studies of the mode of action of medicinally active compounds. Prerequisite: Consent of the Faculty. Note: Offered alternate years.

PHARM 625. *Stereochemical Aspects of Medicinal and Pharmaceutical Chemistry.* ★3 (Second Term, 3-0-0). The influence of molecular geometry upon the action of compounds used in medicine. Prerequisite: Consent of the Faculty.

PHARM 626. *Applications of Mass Spectrometry to Medicinal and Pharmaceutical Chemistry.* ★3 (Second Term, 3-0-0). Examples of the use of mass spectrometry in the identification of medicinal compounds are considered. Diagnostic spectra of extracts of medicinal preparations, identification of drug metabolites and applications of mass spectrometry to chemical toxicology are studied. Prerequisite: Consent of the Faculty. Note: Offered alternate years.

PHARM 630. *The Metabolism and Excretion of Drugs.* ★3 (Second Term, 3-0-3). The chemistry, biochemistry and kinetics of drug metabolism together with the factors affecting metabolism; the practical aspects of in vitro and in vivo studies of drug metabolism; the excretion of drugs by various routes and factors affecting excretion, the kinetics of excretion; analog computing and the use of the analog computer in problems concerned with the absorption, distribution, metabolism, and excretion of drugs. Note: Offered alternate years.

PHARM 664. *Advanced Topics in Clinical Pharmacy.* ★3 (First Term, 1-0-3). Tutorial and practicum sessions used to review rational therapeutics and to demonstrate clinical pharmacy responsibilities in a selected number of disease states. The student will have the opportunity to develop practical skills in establishing safe and effective drug use and in providing patient directed information on specific therapeutic agents. Major areas such as hypertension, diabetes and renal disorders will be considered. Prerequisites: PHARM 464, 487 and 488 or consent of the Faculty.

PHARM 665. *Drug Information.* ★3 (First Term, 1-0-3). The course encompasses the methods and techniques for drug information handling and its effective utilization in the professional practice of pharmacy. Prerequisites: PHARM 410, Statistics (STATS 241 or PSYCO 309 or equivalent) or consent of the Faculty.

PHARM 699. *Graduate Seminar.* ★0 (0-1s-0). Topics related to the fields of specialization of the graduate student.

144.11 Physiology

PHYSL 452. *Human Physiology.* ★6 (3-0-0; 3-0-3). A comprehensive lecture and laboratory course on mammalian and human physiology. Available to students in the Faculty of Pharmacy only.

WORLD
UNIVERSITY GAMES
EDMONTON 83

Faculty of Physical Education and Recreation

151 INTRODUCTORY

151.1 Members of the Faculty

151.1.1 OFFICERS OF THE FACULTY

Professor and Dean
To be appointed

Professor and Associate Dean
To be appointed

Assistant to the Dean
W. E. TATARCHUK, M.P.E.

Administrative Officer
R. D. KIRSTEIN, B.P.E.

151.1.2 DEPARTMENT OF PHYSICAL EDUCATION

Professor and Chairman
P. L. LINDSAY, Ph.D.

Professors
R. B. ALDERMAN, Ph.D.
W. H. COTTLE, Ph.D.
C. J. DRAKE, M.S. (Joint Appointment)
R. G. GLASSFORD, Ph.D.
R. B. J. MACNAB, Ph.D.
H. J. McLACHLIN, Ph.D.
S. MENDRYK, Ph.D.
G. REDMOND, Ph.D.
M. SINGH, Ph.D.
J. TERAUDS, Ph.D.
A. E. WALL, Ph.D.
R. B. WILBERG, Ph.D.

Associate Professors
P. R. CONGER, M.A.
J. G. DONLEVY, M.A. (Joint Appointment)
M. A. HALL, Ph.D.
D. J. HARRIS, B.A.
E. B. MITCHELSON, Ph.D.
S. E. NEILL, M.Sc.
H. A. QUINNEY, Ph.D.
H. A. SCOTT, Ph.D.
G. J. SMITH, Ph.D.
R. D. STEADWARD, Ph.D.

Assistant Professors
W. BEDINGFIELD, Ph.D.
A. BELCASTRO, Ph.D.
S. J. O'BRIEN, M.P.E. (Joint Appointment)
M. L. PADFIELD, M.A.
F. A. TALLY, M.Sc. (Joint Appointment)
E. J. WATKINSON, Ph.D.

Administrative Officer
P. D. BATES, B.Ed.

151.1.3 DEPARTMENT OF RECREATION ADMINISTRATION

Professor and Chairman
T. L. BURTON, Ph.D.

Professors
A. F. AFFLECK, M.S.
R. P. HERON, Ph.D.
E. McFARLAND, Ph.D.

Associate Professors
V. BLAKELY, M.A.
L. L. LANIER, Ph.D.
G. S. SWINNERTON, Ph.D.
L. M. WANKEL, Ph.D.

Assistant Professor
L. BELLA, M.S.W.

151.1.4 DEPARTMENT OF MOVEMENT EDUCATION

Professor and Acting Chairman
M. F. R. SMITH, Ph.D. (Joint Appointment)

Professor
M. ELLIS, Ph.D.

Associate Professors
J. BOORMAN, Ph.D.
A. BORYS, M.Sc. (Joint Appointment)
J. JAMES, M.A.
C. PADFIELD, Ph.D.

Honorary Associate Professors
D. J. SANDE, Ph.D.
J. M. VALLANCE, M.A.

Assistant Professors
A. B. NIELSON, M.A.
L. THOMPSON, M.Ed.

151.1.5 DEPARTMENT OF ATHLETIC SERVICES

Associate Professor and Chairman
E. ZEMRAU, B.Sc.

Professor
C. DRAKE, M.S. (Joint Appointment)

Associate Professor
J. DONLEVY, M.A. (Joint Appointment)

Assistant Professors
J. BARRY, M.A.
S. O'BRIEN, M.P.E. (Joint Appointment)
G. SIMONYI, Dip. P.E. (Joint Appointment)
F. TALLY, M.Sc. (Joint Appointment)

Administrative Officers
B. P. HEANEY, B.Sc.
H. S. D. HOYLES, M.A.
D. SHOGAN, M.A.

151.1.6 ADDITIONAL MEMBERS OF FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Professors
L. S. BEAUCHAMP, Ed. D. (Secondary Education)
B. R. J. SPROULE, M.D. (Medicine)

Associate Professors
G. HORLICK, Ph.D. (Chemistry)
A. S. A. MOHSEN, Ph.D. (Sociology)

Assistant Professors
J. R. BUTLER, M.A. (Agriculture and Forestry)
J. KRAMER, Ph.D. (Physical Therapy)

Registrar of the University
W. A. BLANCHARD, Ph.D.

151.2 General Information

A School of Physical Education was organized under General Faculties Council in 1954. The degree program in Physical Education has been offered since 1950. The program originally led to the degree of Bachelor of Education in Physical Education, which has been superseded by the degree of Bachelor of Physical Education. Effective April 1, 1964 the School became the Faculty of Physical Education. In 1976 the name was changed to the Faculty of Physical Education and Recreation.

Since 1963 the Faculty has also offered a four-year program leading to the degree of Bachelor of Arts in Recreation Administration.

In addition to these two programs, the Faculty provides instruction in teaching methods in both health and physical education for students in the Faculty of Education, organizes and supervises intramural programs, and acts in an advisory capacity for the intercollegiate athletic programs.

Students holding the degree of B.P.E. or its equivalent may undertake graduate study in physical education leading to the degrees of Master of Arts, Master of Science and Doctor of Philosophy. Students holding the degree of B.A. in Recreation Administration may undertake graduate study leading to the degree of Master of Arts in Recreation Administration. The calendar of the Faculty of Graduate Studies and Research should be consulted for further details.

Teacher Education. Students wishing to qualify for teaching positions have the option of completing the Bachelor of Physical Education Degree and then taking teacher certification or they may complete the Bachelor of Education Degree with a major in physical education. The major in physical education is offered to students in both the elementary and secondary routes. The Bachelor of Physical Education Degree offers approximately forty percent more professional physical education courses but requires one additional year for certification.

Intramural and Recreational Athletics. The Faculty of Physical Education and Recreation, with the cooperation of the Department of Athletic Services, organizes and administers a comprehensive program of intramural and recreational sports. Primary purposes of the program are to develop recreational skills and to encourage sportsmanship and friendly relations among the students of the University through athletic competition. Individual and group competitive sports for men and women include tennis, golf, track and field, cross-country running, curling, squash, handball, water polo, basketball, hockey, volleyball, touch football, swimming, raquetball, bowling, skiing, field hockey, team handball, table tennis, fencing, billiards, yoga, and fitness. Facilities include gymnasia, two swimming pools, outdoor playing fields, and the University ice arena.

Intercollegiate Athletics. As a member of the Canada West University Athletic Association, the University provides opportunities for men and women to compete in intercollegiate sports. Included in the activities for men are cross-country running, gymnastics, volleyball, basketball, hockey, wrestling, soccer, rugger, swimming and diving, track and field, football, curling, and judo. Women compete in cross-country running, track and field, basketball, volleyball, curling, gymnastics, swimming, field hockey and diving.

151.3 Clothing

Students are advised that the purchase of physical education wearing apparel must be completed prior to the start of activity classes.

Activity course dress requirement for first class: Students are expected to attend the first class of an activity course appropriately dressed for active participation. Information concerning dress for each activity course will be posted at Part III of In-Person Registration and will be available through the Department of Physical Education.

152 FACULTY REGULATIONS

152.1 Admission

Admission requirements of the Faculty of Physical Education and Recreation will be found in § § 13.1 and 13.15 of the University Regulations and Information for Students Calendar.

Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

In addition all applicants for the Bachelor of Physical Education Degree must have a personal interview with a representative of the Faculty of Physical Education and Recreation. Also, the candidates will be evaluated by means of a questionnaire as well as having to be able to successfully complete the Faculty Fitness and Ability Test. A physical examination is required of all applicants prior to admission to the B.P.E. program.

Candidates for the B.A. degree in Recreation Administration must satisfactorily complete a questionnaire and supply two letters of reference.

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test center, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of Registrar, Rm. 123, Administration Building, University of Alberta.

152.2 *Academic Standings and Graduation*

(1) To be granted the B.P.E. degree or the B.A. degree in Recreation Administration, a student must obtain a passing mark or better in all courses in the final two years of the respective degree program, obtaining a grade-point average of at least 5.0.

NOTE: A grade of 3C (credit conceded) is not normally permitted in any course leading to a degree in Physical Education or Recreation Administration. For admission to a course with a prerequisite requirement a grade of 4 must be obtained in the prerequisite course.

(2) A student will not be allowed to write more than five supplemental examinations in full-session courses or the equivalent, for the purpose of obtaining passing marks, or of raising his/her average to the required level.

(3) A student will not be allowed to write more than two supplemental examinations in full-session courses or equivalent in any year. (This regulation may, in exceptional circumstances, be relaxed for first-year students).

(4) A student who repeats a year will be granted no supplemental privileges in the courses taken that year and must pass all courses in the repeated year with a grade-point average of at least 5.0 to be allowed to continue.

(5) The privilege of repeating a year will be granted to a student not more than once during his/her candidacy for a degree in this Faculty unless by special permission of the Dean.

152.3 *Changes in Registration*

(1) *Withdrawal from courses.* The deadlines for withdrawing from courses are as follows: from a full-session course, February 12; from a single-term course offered in First Term, November 12; from a single-term course offered in the Second Term, March 1st.

(2) *Changes in Registration.* The deadlines for changes in registration, daytime courses are:

First Term and full-session courses: September 17th.

Second Term courses: January 11th.

152.4 *Appeals and Grievances*

Student grievances of an academic nature sometimes arise. If this occurs, students in the Faculty of Physical Education and Recreation are advised to first contact the instructor concerned where, in most cases, satisfactory explanations will be obtained. If not, students are advised to see the Department Chairman and the Dean in that order.

For further information regarding Appeals Procedures at the Faculty level the student should seek the advice of the Dean.

For other information related to Appeals and Grievances students are directed to § 16.7 of the University Regulations and Information for Students Calendar.

152.5 *Attendance in Dance, Health Education, and Physical Education Courses*

(1) *Attendance at the first class:* Due to the demand for spaces in many dance, health education, and physical education courses, it is necessary to obtain accurate enrolment figures as early as possible in the term to allow students on waiting lists to be considered for available spaces. Therefore, students who are not in attendance at the first two class meetings (without giving PRIOR written notice to the Department of Physical Education) will be subject to having their names struck from the official class list and will not be permitted to attend further meetings of the class.

(2) *Attendance in courses:* Since attendance at lectures, participation in classroom discussions and projects, and the completion of assignments are important components of most courses, students will serve their interests best by regular attendance. Those who choose not to attend must assume whatever risks are involved. Thus, a student may be refused permission to write the final examination in a course on the recommendation of the department concerned and with the concurrence of the Dean of the Faculty in the following circumstances:

1. The student has neglected to do a substantial portion of the written assignments in a course of which these are an essential feature, or has attended insufficiently in a course in which class participation is a necessity.
2. The student has neglected to do a sufficient amount of the practical or laboratory work in a course in which these are considered a basic re-

quirement (See University Regulations and Information for Students Calendar, sections 16.5 and 16.3.2(5)).

The Department of Physical Education's policy concerning attendance at laboratory, practicum, seminars, and physical activity classes is that unexcused absence from more than 10% of class sessions is considered to be insufficient attendance. Therefore, in such a situation, permission to take the final examination may be refused.

153 PROGRAMS OF STUDY

153.1 The Degree of B.P.E.

First Year

	First Term Hours	Second Term Hours
Arts or Science Option	3-0-0	—
Arts or Science Option	—	3-0-0
Science Option	3-0-2	—
Science Option	—	3-0-2
P ED 200 (Introduction to Physical Education)	3-0-0	—
P ED 201 (Biomechanics)	3-0-2	or 3-0-2
P ED 203 (Kinesiology I)	2-0-2	—
P ED 204 (Structural Anatomy)	3-0-2	—
P ED 205 (Kinesiology II)	—	2-0-2
P ED 206 (Functional Anatomy)	—	2-0-2
P ED Option (Group B)	—	3-0-0
P ED Option (Group B)	—	3-0-0

**Physics 203 must be taken in first term if Physics 20 has not been successfully completed.

Second Year

Non-Department Option	3-0-0	3-0-0
Physiology 260	3-0-0	3-0-1
P ED 202 (Movement Analysis)	—	3-0-2
P ED 207 (Growth and Development)	3-0-0	—
P ED 208 (Measurement and Evaluation)	3-0-0	—
P ED 209 (Project)	—	3-0-0
Core Course in a Route	3-0-0	—
Core Course in a Route	—	3-0-0
Core Course in a Route	—	3-0-0
Physical Education Option	3-0-0	—

Third Year

Non-Department Option	3-0-0	3-0-0
P ED 300 (Human Performance)	3-0-0	—
P ED 302 (Physiology of Exercise)	3-0-2	—
P ED 303 (Psychology of Sport)	3-0-0	—
†P ED 309 (Project) or P ED (Group A) Option	—	3-0-0
Route Related Course	—	3-0-0
Route Related Course	—	3-0-0
Route Related Course	—	3-0-0
Physical Education Option	3-0-0	—
Option	3-0-0	—
Option	—	3-0-0

Fourth Year

P ED 400 (Persistent Problems)	3-0-0	—
P ED 401 (Sociology of Sport)	3-0-0	—
P ED 402 (History of Sport and Physical Education)	3-0-0	—
†P ED 409 (Project) or P ED (Group A) Option	—	3-0-0
Route Related Course	—	3-0-0
Route Related Course	—	3-0-0
Route Related Course	—	3-0-0
Physical Education Option	3-0-0	—
Physical Education Option	—	3-0-0
Option	3-0-0	—
Option	—	3-0-0
Option	—	3-0-0

†Students must enrol in either P ED 309 or P ED 409.

153.1.1 Route Courses

Six routes or areas of concentration are offered — Adapted Physical Education, Administration, Coaching, Dance, Outdoor Education, Athletic Training and Conditioning.

In the second year each student shall take a minimum of three core courses from the available routes. Subsequently, a student shall elect to major in a minimum of one route. A major is comprised of the core course and six route related courses. The coaching route is comprised of one core course and seven route related courses.

Students who choose not to take a seven-course route concentration may take the required three core courses plus a minimum of four route-related courses in one area and choose the other two route-related courses from required Physical Education courses in another route area.

153.1.1.1 ADAPTED PHYSICAL EDUCATION

Core Course

P ED 240 (Adapted Physical Education)

Required Courses

P ED 340 (Practicum in Physical Education for the Mentally Retarded)

P ED 440 (Practicum in Physical Education for the Physically Disabled)

Option Courses—four single-term courses, chosen from the following. The majority of these courses require consent of the Department concerned and have limited numbers and sections available for B.P.E. students.

ED PSY 341 (Psychology of Exceptional Children and Youth)
ED PSY 343 (Education of Exceptional Children and Youth)
ED PSY 357 (Behavioral and Instructional Management of Exceptional Children)
ED PSY 411 (Introduction to Guidance)
ED PSY 469 (Human Development and Education)
ED PSY 471 (Learning and Instruction)
PSYCO 260 (Basic Psychological Processes)
PSYCO 354 (Perceptual and Cognitive Development in Infant and Children)
PSYCO 361 (Principles of Behavior Change)
PSYCO 489 (Abnormal Psychology)
SOC 324 (Sociology of Deviance and Conformity)
SOC 325 (Criminology)
SOC 375 (Sociology of Aging)
SOC 427 (Juvenile Delinquency)
REC 371 (Recreation Services for Special Groups)
OCCTH 207 (History Systems and Resources of Rehabilitation)
OCCTH 436 (Mental Retardation and Child Dysfunction)
OCCTH 437 (Occupational Therapy in Geriatrics)

Other options will be considered on an individual basis.

153.1.1.2 ADMINISTRATION

Core Course

P ED 250. (Introduction to the Administration of Sport and Physical Education Programs)

Required Courses

P ED 350. (Practicum in Administration)
P ED 450. (Advanced Analysis of the Administration of Sport and Physical Education Programs)
ORG T 305. (The Theory of Formal Organization)
ACCTG 307. (Financial Accounting)

Option Courses—three required

For those students planning physical education careers in educational institutions, the following courses are suggested:

EDADM 401 The role of the teacher
ED AV 361 Audio / Visual Communications
ED AV 363 Preparation of Instructional materials
ORG T 303 Behavior in Organizations
REC 301 Planning for Leisure: Principles and Processes
REC 365 Sport and the Community
REC 441 School Community Recreation
REC 451 Community Recreation
SOC 202, 341

For those students planning physical education, sport and athletic careers in non-educational institution environments, the following courses are suggested:

ECON 201 Introduction to Micro-Economics
ECON Introduction to Macro-Economics
ECON 351 The Public Sector.
INT D 459 Introduction to Community Development
MARK 304 Fundamentals of marketing
ORG T 303 Behavior in Organizations
POL S 321 Canadian Government
POL S 322 Local Government and Administration
POL S 323 Local Government and Politics
POL S 425 Canadian Public Administration
POL S 426 Civil Service in Canada
POL S 429 Government and Politics in Alberta
POL S 431 Administrative Behavior
REC 301 Planning for Leisure: Principles and Processes
REC 365 Sport and the Community
REC 441 School Community Recreation
REC 451 Community Recreation
REC 459 Planning Recreation Facilities
SOC 447 Leadership
SOC 480 Theories of Social Change

153.1.1.3 COACHING

Core Course

P ED 260 (Introduction to Coaching)

Required Courses

P ED 360 (Coaching Practicum)
P ED 460 (Advanced Coaching Practicum)
P ED 461 (Psychology of Coaching)
One introductory activity course in an individual sport.
One introductory activity course in a team sport.
One coaching course in an individual sport.
One coaching course in a team sport.

Option Courses — Recommended for inclusion in the B.P.E. degree program as non-departmental options or free options.

ED AV 363
MOV 321, 421
P ED 250, 301, 305
REC 365, 441, 451

153.1.1.4 DANCE

Core Course

DANCE 270 (Introduction to Modern Dance)

Required Courses

DANCE 370 (Dance Perspectives)
DANCE 371 (Modern Dance Techniques)
DANCE 372 (Modern Dance Composition)
DANCE 470 (Dance Practicum)

Option Courses—two of the following

DANCE 275 (Dance Forms)
DANCE 375 (Social Dance)
DANCE 376 (International Folk Dance)
MOV 327 (Creative Dance)
MOV 423 (Creative Movement for Young Children)

153.1.1.5 OUTDOOR EDUCATION

Core Course

P ED 280 (Introduction to Outdoor Education)

Required Courses

P ED 381 (Cold Weather Outdoor Education)
P ED 382 (Warm Weather Outdoor Education)
P ED 383 (Outdoor Education Administration and Programming)
P ED 480 (Outdoor Leadership and Group Processes)

Option Courses—two of the following

ANTHR 202, 330, 346, 350, 419, 423, 493
ART 231
ASTRO 253
BIOL 296, 298,
BOT 301, 302, 322
CART 301
ECON 365
ENT 209
FOR 315, 360, 462, 465
GEOG 230, 231, 309, 329, 336, 364, 381, 424, 449, 454, 465
HIST 371, 372
INT D 353, 369, 466, 467
MOV 389
PHIL 335
P ED 223, 238, 239, 481
PL SC 341, 350, 460
*REC 390, 435, 441, 459, 463
ZOOL 325, 326, 404, 465, 466, 467

*REC 451 is a prerequisite to all Recreation courses.

153.1.1.6 ATHLETIC TRAINING AND CONDITIONING

Core Course

P ED 290 (Scientific Basis of Athletic Training and Conditioning)

Required Courses

P ED 391 (Practicum in Conditioning Methods and Training Techniques)
P ED 491 (Advanced Conditioning Methods)
P ED 492 (Advanced Training Methods and Techniques)

Option Courses (choose equivalent of 3 one term courses)

BIOL 296, 297, 298, 299, 301, 302
CHEM 250
FD NU 325, 327
HE ED 391
P ED 301, 408, 461
PTHER 310
PHYS 203

153.2 The Degree of B.A. in Recreation Administration

The student's program over four years is composed, essentially, of 2 sets of courses: those offered by the Department of Recreation Administration as core to the entire program (core professional courses), as core to a student's chosen pattern or area of interest (pattern

professional courses), or as recreation options (option professional courses); and those offered by other departments at the University and recognized as core to the entire program (core foundation courses), as core to a student's chosen pattern or area of interest (pattern foundation courses), or as pattern related or approved options. The latter set of courses is drawn from such fields as Sociology, Political Science, Fine Arts, Psychology, Biology, Forest Science, Physical Education etc. The intent of the two sets of courses is to provide all students with a strong common core program, together with an opportunity to obtain a beginning competency in one of a range of areas of professional interest. The student's program is composed of the equivalent of 44 single-term courses of which a minimum of 14 must be Recreation courses, and a minimum of 18 taken in the Faculties of Arts and Science.

The four year program leading to the B.A. in Recreation Administration offers the student insights into the broad field of recreation together with an opportunity for some concentration in one of the following patterns or areas of interest:

1. Community Development and Leisure Services
2. Management and Supervision
3. Planning and Management of Recreation Environments
4. Recreation through the Cultural Arts
5. Recreation through Physical Activity
6. Heritage Interpretation
7. Outdoor Recreation
8. Recreation for Special Populations
9. Individual Program

Those persons already holding a Bachelor's degree who seek to obtain a B.A. degree in Recreation Administration are normally required to undertake a minimum 22 single-term courses. Students lacking essential social science courses may be asked to take additional courses.

First Year

	First Term Hours	*Second Term Hours*
REC 255 *or* 451	3-0-0	—
REC 257	—	3-0-2
Activity option	3-0-0	or 3-0-0
English *or* Philosophy *or* History	3-0-0	or 3-0-0
Economics *or* Political Science	3-0-0	or 3-0-0
Psychology 260 *or* Educational Psychology 269	3-0-0	—
Psychology 261 *or* Educational Psychology 271	—	3-0-0
*Sociology 202	3-0-0	3-0-0
Junior Science (Biology, Geography, *or* other approved science option)	3-0-3	or 3-0-3
Pattern foundation *or* Approved option	3-0-0	or 3-0-0

Second Year

REC 301	3-0-0	3-0-0
REC 345	3-0-0	3-0-0
REC 350	3-0-0	3-0-0
REC 351	3-0-0	3-0-0
REC 371	3-0-1	3-0-1
Activity option	3-0-0	or 3-0-0
Accounting 307	3-0-2	or 3-0-2
Pattern foundation	—	or —
Pattern foundation	—	or —
Pattern foundation *or* Pattern related option or *SOC 311	—	or —
Pattern foundation *or* Pattern related option *or* *SOC 311	—	or —

Third Year

REC 455	3-0-0	or 3-0-0
REC 457	3-0-2	or 3-0-2
REC 465	3-0-0	or 3-0-0
REC 469	3-0-0	or 3-0-0
*SOC 311 *or* Pattern foundation *or* Pattern related option	—	or —
*SOC 311 *or* Pattern foundation *or* Pattern related option	—	or —
REC pattern professional	—	or —
REC pattern professional	—	or —
Pattern foundation	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern foundation *or* Pattern related option	—	or —

Fourth Year

REC 458	3-0-0	or 3-0-0
REC pattern professional *or* Pattern foundation	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern foundation *or* Pattern related option	—	or —
Pattern related option *or* Approved option	—	or —
Pattern related option *or* Approved option	—	or —
Pattern related option *or* Approved option	—	or —
Pattern related option *or* Approved option	—	or —

*Full-session courses — the equivalent of two single-term courses must be taken.

153.3 Teacher Education

Students interested in specializing in elementary school physical education, or who desire to include a secondary school physical education major within the Bachelor of Education program, should consult the Faculty of Education Calendar, particularly § § 73.2.4 and 73.3.3.

153.4 Graduate study

The Faculty of Physical Education and Recreation offers programs leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy. Students holding the degree of B.A. in Recreation Administration may undertake graduate study leading to the degree of Master of Arts in Recreation Administration. Well-equipped facilities are available for a limited number of graduate students.

For further information write to: Chairman, Graduate Committee, Department of Physical Education, Faculty of Physical Education and Recreation, University of Alberta, Edmonton, Alberta T6G 2H9.

154 DETAILS OF COURSES

154.1 General Information

Courses open to students in the Faculty of Physical Education and Recreation are listed here in groups, as follows: courses in the B.P.E. program; courses in the B.A. (Recreation Administration) program; courses in the Department of Movement Education; and graduate courses in Physical Education, Recreation Administration and Movement Education.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full-session course is weighted 6. A single-term course is normally weighted 3. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the research project. Some courses are offered for credit only, and carry no weight.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

154.2 Courses in the B.P.E. Program

154.2.1 REQUIRED DEPARTMENT COURSES

P ED 200. *Introduction to Physical Education.* ★3 (First Term, 3-0-0). The study of the role of physical education as a dynamic force of man. Students will be required to attend a weekend camp in the third weekend of September OR complete a major assignment to be determined by the instructor. (For B.P.E. students only.)

P ED 201. *Biomechanics.* ★3 (either term, 3-0-2). A study of mechanics with application limited to the human body. Includes the principles of both statics and dynamics. (For B.P.E. students only.) Prerequisite: Physics 20 or PHYS 203.

P ED 202. *Movement Analysis.* ★3 (Second Term, 3-0-2). The study of techniques of analyzing movement patterns and determinants for the purpose of improving abilities to diagnose, modify and develop motor performance. Prerequisites: P ED 201, P ED 204 and P ED 206. (For B.P.E. students only.)

P ED 203. *Kinesiology I.* ★3 (First Term, 4-0-0). Application and practice of movement principles as they relate to individuals in competitive, aesthetic and expressive situations. Corequisite: PHYS 203 or P ED 201 (For B.P.E. students only.)

P ED 204. *Structural Anatomy.* ★3 (First Term, 3-0-3). A regional survey of the human body as it relates to the development of human movement. (For B.P.E. and Nursing students only.)

P ED 205. *Kinesiology II.* ★3 (Second Term, 0-0-6). Theory and practice of movement principles as they relate to projecting, receiving and retaining a variety of moving objects. Prerequisites: P ED 201, P ED 203, and P ED 204. (For B.P.E. students only.)

P ED 206. *Functional Anatomy.* ★3 (Second Term, 2-0-2). An introduction to functional anatomy as it relates to human movement. Prerequisite: P ED 204. (For B.P.E. students only.)

P ED 207. *Growth and Development.* ★3 (First Term, 3-0-0). A study of the sequential changes in physical growth and motor development with emphasis on individual differences. (For B.P.E. students only.)

P ED 208. *Measurement and Evaluation.* ★3 (First Term, 3-0-0). Methods of measuring and evaluating physical activities and programs. (For B.P.E. students only.)

P ED 209. *Project.* ★3 (Second Term, 3-0-0). An individual field or research project with children or adults in physical activity. (For B.P.E. students only.)

PHYSL 260. *Elementary Physiology.* ★6 (3-0-0; 3-0-1). Introduction to human physiology from the cellular to systemic level, special emphasis on systems which adapt to exercise stress. A number of practical demonstrations will be presented throughout the course. (For B.P.E. students only.)

P ED 300. *Human Performance.* ★3 (First Term, 3-0-0). An introduction to the process involved in learning and performance with applications to teaching, coaching, and competitive games. Prerequisite: Successful completion of the first two years of the B.P.E. program at The University of Alberta, or PSYCO 260 or equivalent.

P ED 302. *Physiology of Exercise.* ★3 (either term, 3-0-2). An introduction to physiological adaptations to stress of exercise and training. Prerequisite: PHYSL 260 or equivalent.

P ED 303. *Psychology of Sport.* ★3 (either term, 3-0-0). Play theory; personality structure and dynamics of athletics, motivational indices in physical activities and competitive athletics and attitudes toward physical activity. Prerequisite: Successful completion of the first two years of the B.P.E. program at The University of Alberta, or PSYCO 260 or equivalent.

P ED 309. *Project.* ★3 (Second Term, 3-0-0). An individual or group research or field project focussed on the adaptation effects of sports and physical activities. (For B.P.E. students only.) Prerequisite: P ED 209.

P ED 400. *Persistent Problems.* ★3 (either term, 3-0-0). An examination of physical education and sport according to various philosophical positions and historical ideas in an attempt to provide the student with the background to develop a consistent stand on the selected problems and issues confronting contemporary physical education. (For B.P.E. students only.)

P ED 401. *Sociology of Sport.* ★3 (either term, 3-0-0). The characteristics, processes, and problems of sport as a social system with particular reference to North American society.

P ED 402. *History of Sport and Physical Education.* ★3 (either term, 3-0-0). An overview of the social significance of physical education and sport from ancient to modern times, with special reference to developments in Canada.

P ED 409. *Project.* ★3 (Second Term, 3-0-0). An individual or group research or field project focussed upon the sociocultural processes affecting an individual's participation patterns in physical activities. (For B.P.E. students only.) Prerequisite: P ED 209.

154.2.2 OPTIONAL DEPARTMENT COURSES

Options in the B.P.E. Program are divided into two groups. A student must select a minimum of two from Group A and four from Group B in addition to courses taken as part of the student's major route.

Open options may be elected from within the Department of Physical Education or may be elected from other departments.

Group A Options

P ED 240 — Adapted Physical Education

P ED 250 — Introduction to the Administration of Sport and Physical Education Programs

P ED 260 — Introduction to Coaching

DANCE 270 — Introduction to Modern Dance

P ED 280 — Introduction to Outdoor Education

P ED 290 — Scientific Basis of Athletic Training and Conditioning
P ED 301 — Biomechanics of Physical Activity
P ED 305 — Officiating
P ED 311 — Basketball Coaching
P ED 313 — Football Coaching
P ED 314 — Ice Hockey Coaching
P ED 315 — Soccer Coaching
P ED 324 — Wrestling Coaching
P ED 325 — Gymnastics Coaching
P ED 329 — Track and Field Coaching
P ED 340 — Practicum in Physical Education for the Mentally Retarded
P ED 350 — Practicum in Administration
P ED 360 — Coaching Practicum
DANCE 370 — Dance Perspectives
DANCE 372 — Modern Dance Composition
P ED 381 — Cold Weather Outdoor Education
P ED 382 — Warm Weather Outdoor Education
P ED 383 — Outdoor Education Administration and Programming
HE ED 391 — Health Education in Secondary Schools I
P ED 391 — Practicum in Conditioning Methods and Training Techniques.
HE ED 393 — Health Education in Secondary Schools II
HE ED 395 — Health Education for the Classroom Teacher
HE ED 397 — Family Life Education for Secondary Schools I
HE ED 399 — Family Life Education for Secondary Schools II
P ED 405 — Comparative Physical Education and Sport
P ED 408 — Introduction to Research
P ED 427 — Principles of Aquatic Instruction
P ED 428 — Coaching Competitive Swimming
P ED 440 — Practicum in Physical Education for the Physically Disabled
P ED 450 — Advanced Analysis of the Administration of Athletic and Physical Education Programs
P ED 460 — Advanced Coaching Practicum
P ED 461 — Psychology of Coaching
DANCE 470 — Dance Practicum
P ED 480 — Practicum in Outdoor Leadership and Group Processes
P ED 481 — Practicum-Outdoor Skills Development
HE ED 491 — Community Health I
P ED 491 — Advanced Conditioning Methods
P ED 492 — Advanced Training Techniques
HE ED 493 — Community Health II
HE ED 495 — Seminar in Elementary School Health Education I
HE ED 497 — Seminar in Elementary School Health Education II
P ED 499 — Directed Studies

Group B Options:

P ED 210 —Physical Fitness Theory and Practice
P ED 211 — Introduction to Basketball
P ED 212 — Introduction to Field Hockey
P ED 213 — Introduction to Football
P ED 214 — Introduction to Ice Hockey
P ED 215 — Introduction to Soccer
P ED 216 — Introduction to Volleyball
P ED 217 — Introduction to Lacrosse
P ED 223 — Boating
P ED 224 — Introduction to Freestyle Wrestling
P ED 225 — Introduction to Gymnastics
P ED 227 — Introduction to Aquatics
P ED 228 — Introduction to Track and Field I
P ED 229 — Introduction to Track and Field II
P ED 231 — Court Sports
P ED 232 — Curling and Bowling
P ED 233 — Introduction to Fencing
P ED 234 — Introductory Golf
P ED 235 — Judo and Yoga
P ED 236 — Racquet Sports
P ED 237 — Ice Skating
P ED 238 — Skiing
P ED 239 — Skin and Scuba Diving
DANCE 275 — Dance Forms
P ED 312 — Field Hockey Coaching
P ED 316 — Volleyball Coaching
P ED 327 — Advanced Aquatics
P ED 328 — Synchronized Swimming
P ED 333 — Fencing Coaching
DANCE 371 — Modern Dance Techniques
DANCE 375 — Social Dance
DANCE 376 — International Folk Dance

NOTE A: IN THE 1981-82 WINTER SESSION THE FOLLOWING OPTIONS ARE NOT EXPECTED TO BE OFFERED: P ED 217, 223, 232, 233, 235, 237, 238, 305, 312, 325, 333, 507, 544, 657, 661, 662, 663, 665, H ED 393, 395, 397, 399, 491, 493, 495, and 497.

NOTE B: ALL COACHING COURSES REQUIRE THE APPROPRIATE PREREQUISITE OR THE CONSENT OF THE DEPARTMENT.

NOTE C: ACTIVITY COURSE DRESS REQUIREMENT FOR FIRST CLASS: Students are expected to attend the first class of an activity course appropriately dressed for active participation. Information concerning dress for each activity course will be posted at Part III of In-Person Registration and will be available through the Department of Physical Education.

P ED 210. *Physical Fitness Theory and Practice.* ★3 (either term, 2-0-2). Knowledge and understanding of basic concepts of fitness and nutrition with practical application geared to individual needs. (For B.P.E. students only).

P ED 211. *Introduction to Basketball.* ★3 (either term, 3-0-0). The theory, practice, and teaching of the fundamental skills of basketball.

P ED 212. *Introduction to Field Hockey.* ★3 (First Term, 3-0-0).

P ED 213. *Introduction to Football.* ★3 (First Term, 3-0-0).

P ED 214. *Introduction to Ice Hockey.* ★3 (either term, 3-0-0). The theory, practice and teaching of the fundamental skills of ice hockey. Emphasis on skill acquisition. Skating prerequisite: Students must possess the minimum skating ability of an average hockey player.

P ED 215. *Introduction to Soccer.* ★3 (First Term, 3-0-0).

P ED 216. *Introduction to Volleyball.* ★3 (either term, 3-0-0).

P ED 217. *Introduction to Lacrosse.* ★3 (First Term, 3-0-0).

P ED 223. *Boating.* ★3 (Spring Session, 3-0-0). Introduction to the popular small water craft of Western Canada. Emphasis is generally on the open Canadian canoe, but may vary from year to year. Field trips may be required. A $10.00 user fee may be collected for the up-keep of the equipment used.

P ED 224. *Introduction to Freestyle Wrestling.* ★3 (either term, 3-0-0).

P ED 225. *Introduction to Gymnastics.* ★3 (either term, 3-0-0). Provides theoretical and practical foundations common to recreational and competitive gymnastics. Successful completion of course gives participant Technical Level I Certification.

P ED 227. *Introduction to Aquatics.* ★3 (either term, 3-0-0). This course is designed for non-swimmers. Those with a level of swimming beyond Junior Red Cross should register in P ED 327. Those beyond the appropriate level of competence may be asked to withdraw from this course if inappropriately registered.

P ED 228. *Introduction to Track and Field I.* ★3 (First Term 3-0-0). Sprinting, relay racing, hurdling, distance running, shot putting, disc throwing, long jumping, flop-style high jumping and related strength training.

P ED 229. *Introduction to Track and Field II.* ★3 (Second Term 3-0-0). Triple jumping, straddle-style high jumping, pole vaulting, javelin throwing, hammer throwing, sprinting, and related strength training.

P ED 231. *Court Sports.* ★3 (either term, 1.5-0-3). Selection will be made from handball, racquetball, and squash. Students must purchase own equipment.

P ED 232. *Curling and Bowling.* ★3 (either term, 3-0-0).

P ED 233. *Introduction to Fencing.* ★3 (either term, 3-0-0). Introduction to the basic elements of attack, defence, and tactics of fencing.

P ED 234. *Introductory Golf.* ★3 (First Term, 3-0-0). A fee of $25.00 will be charged for green and range fees. (For B.P.E. students only).

P ED 235. *Yoga and Judo.* ★3 (either term, 3-0-0).

P ED 236. *Racquet Sports.* ★3 (First Term, 3-0-0). Tennis and badminton.

P ED 237. *Power and Creative Skating.* ★3 (either term, 3-0-0). To increase one's personal technique, skill, and teaching abilities in the areas of power, creativity, dance, and games on ice. Note: Students must provide their own skates (hockey or figure skates are acceptable).

P ED 238. *Skiing.* ★3 (either term, 3-0-0). Alpine and cross-country skiing.

P ED 239. *Skin and Scuba Diving.* ★3 (Second Term, 3-0-1). The scientific principles of skin and scuba diving and their practical application to the sport of skin and scuba diving. Course may lead to Scuba certification at the National level (PADI, NAUI, ACUC). Students must provide their own snorkel gear. A fee will be charged for air used. Prerequisites: P ED 227, Red Cross Intermediate Level or equivalent; lifesaving training at the RLSS bronze is highly desirable. All students should be prepared to participate in a Spring trip in order to experience open-water diving.

P ED 240. *Adapted Physical Education.* ★3 (either term, 3-0-0). A survey of handicapping conditions and methods of adapting physical activity programs. (Non-B.P.E. students must obtain consent of the Department.)

P ED 250. *Introduction to the Administration of Sport and Physical Education Programs.* ★3 (either term, 3-0-0). An examination of the administrative methods of conducting physical education and sport programs. (For B.P.E. and Education P. Ed. majors or consent of the Department.)

P ED 260. *Introduction to Coaching.* ★3 (either term, 3-0-0). Theory and practice of coaching sports based on the age and skill level of participants. (For B.P.E. students only.)

DANCE 270. *Introduction to Modern Dance.* ★3 (either term, 3-0-0). Introduction to the study of creative dance technique, improvisation and composition.

DANCE 275. *Dance Forms.* ★3 (either term, 3-0-0). Introduction to one of the dance forms: ballet, jazz, tap or selected ethnic dance forms.

P ED 280. *Introduction to Outdoor Education.* ★3 (either term, 3-0-3). A conceptual and experiential introduction to outdoor/environmental education and leadership. Three weekend field trips are required. A user's fee of $10.00 is charged for maintenance of equipment. B.P.E. students will be given priority, but others are welcomed if space permits.

P ED 290. *Scientific Basis of Athletic Training and Conditioning.* ★3 (either term, 3-0-1). Analysis of practical and theoretical concepts of athletic training and conditioning. Includes an overview of sports medicine, care and prevention of injuries, and safety in athletics and physical education. (For B.P.E. students only.)

P ED 301. *Biomechanics of Physical Activity.* ★3 (either term, 3-0-0). Research techniques in the analysis and synthesis of human movement. Topics include basic scalar and vector computations; nature of forces, moments, and couples; linear and angular kinematics and kinetics; static and dynamic friction; basic fluid dynamics and ballistics; body as a system of levers; and a student project. Prerequisite: P ED 201 or consent of the Department.

P ED 305. *Officiating.* ★3 (First Term, 2-0-1). Techniques and practice of officiating individual and team activities. Prerequisites: Basic courses in at least three team or individual sports or consent of the Department.

P ED 311. *Basketball Coaching.* ★3 (either term, 3-0-0). Emphasis on the coaching and the organization of basketball programs. Prerequisite: P ED 211 or consent of the Department.

P ED 312. *Field Hockey Coaching.* ★3 (First Term, 3-0-0). Prerequisite: P ED 212 or consent of the Department.

P ED 313. *Football Coaching.* ★3 (First Term, 3-0-0). Emphasis on coaching theory. Prerequisite: P ED 213 or consent of the Department.

P ED 314. *Ice Hockey Coaching.* ★3 (either term, 3-0-0). Emphasis on coaching techniques, team systems and various coaching philosophies. Prerequisite: P ED 214 or consent of the Department.

P ED 315. *Soccer Coaching.* ★3 (First Term, 3-0-0). Prerequisite: P ED 215 or consent of the Department.

P ED 316. *Volleyball Coaching.* ★3 (either term, 3-0-0). Prerequisite: P ED 216 or consent of the Department.

P ED 324. *Wrestling Coaching.* ★3 (Second Term, 3-0-0). Prerequisite: P ED 224 or consent of the Department.

P ED 325. *Intermediate Gymnastics.* ★3 (either term, 3-0-0). Course is heavily weighted on the practical side toward intermediate skill development in the competitive Olympic events (four for women and six for men). Prerequisite: P ED 225 or consent of the Department.

P ED 327. *Advanced Aquatics.* ★3 (either term, 3-0-0). This course is designed to introduce the swimmer to advanced stroke techniques and lifesaving skills. RLSS Bronze Certification may be achieved. Prerequisite: P ED 227 or equivalent. Enrollment limited to persons who have not achieved a status higher than Bronze Medallion (i.e. Instructors, NLS, Merit etc.).

P ED 328. *Synchronized Swimming.* ★3 (either term, 3-0-0). This course will include practical and theoretical sessions on synchronized swimming as a recreational and competitive sport. Personal skill development will be pursued. Course contact also examines aspects of instructing, judging, and coaching the sport. Prerequisite: P ED 227; Red Cross Senior Level is desirable.

P ED 329. *Track and Field Coaching.* ★3 (either term, 3-0-0). Development of coaching skills for track and field. Prerequisite: P ED 228 and/or 229 or consent of the Department.

P ED 333. *Fencing Coaching.* ★3 (either term, 3-0-0). This course will lead to a Leadership Certificate in foil. Prerequisite: P ED 233 or consent of the Department.

P ED 340. *Practicum in Physical Education for the Mentally Retarded.* ★3 (either term, 0-2s-2). Supervised experience in physical activity programs for the mentally retarded. Prerequisite: P ED 240 and consent of the Department.

P ED 350. *Practicum in Administration.* ★3 (First Term, 1-0-2). Work experience related to the organization and administration of physical education and/or sport programs. Prerequisite: P ED 250. (For B.P.E. students only.)

P ED 360. *Coaching Practicum.* ★3 (both terms, 2.5-0-0). A practical introduction to coaching under the direction of an approved coach. Prerequisite: P ED 260 or consent of the Department. (For B.P.E. students only.)

DANCE 370. *Dance Perspectives.* ★3 (either term, 3-0-0). The study of dance history with emphasis on the Twentieth Century.

DANCE 371. *Modern Dance Techniques.* ★3 (either term, 3-0-0). Theory and practice of selected dance techniques, advancement of personal movement skills and intellectual understanding of movement/dance principles. Prerequisite: DANCE 270 or consent of the Department.

DANCE 372. *Modern Dance Composition.* ★3 (either term, 3-0-0). Theory and practice of modern dance improvisation and composition, principles of form and design, individual and group choreography, evaluation. Prerequisite: DANCE 270 or consent of the Department.

DANCE 375. *Social Dance.* ★3 (either term, 3-0-0). Theory and practice of social (ballroom) dance forms. Prerequisite: Consent of Department. (For B.P.E., B.Ed., Phys. Ed. major, and Rec. Admin. students only.)

DANCE 376. *International Folk Dance.* ★3 (either term, 3-0-0). The study of folk movement forms in selected cultures.

P ED 381. *Cold Weather Outdoor Education.* ★3 (Second Term, 3-0-3). The winter environment, the physiology of man in cold, cold adaptation, hypothermia and cold injury. Clothing and other equipment and its assessment. Acquisition of skill in winter camping and ski touring, etc. Prerequisite: P ED 280 or REC 280 or consent of the Department. Note: A user's fee of $10.00 is charged for maintenance of equipment. Additional costs include transportation, food and accommodation for off-campus outings.

P ED 382. *Warm Weather Outdoor Education.* ★3 (First Term, 3-0-3). An in-depth study of the physical skills, background knowledge, organizational skills, and basic pedagogy of the popular self-propelled warm weather recreational pursuits. An in-camp practicum is required. Prerequisite: P ED 280 or REC 280 or consent of the Department. Note: A user's fee of $10.00 is charged for maintenance of equipment. Additional costs include transportation, food and accommodation for off-campus trips.

P ED 383. *Outdoor Education Administration and Programming.* ★3 (First Term, 0-4L-0). Principles underlying outdoor education, administration and programming. Prerequisite: P ED 280 or REC 280, or consent of the Department.

P ED 391. *Practicum in Conditioning Methods and Training Techniques.* ★3 (both terms, 2.5-0-0). Prerequisite: P ED 290. Open to third and fourth year B.P.E. students only.

HE ED 391. *Health Education in Secondary Schools I.* ★3 (First Term, 3-0-0).

HE ED 393. *Health Education in Secondary Schools II.* ★3 (Second Term, 3-0-0). A review of various aspects of theory and practice of school health education with considerable emphasis on recent literature for the teacher and student. Prerequisite: HE ED 391.

HE ED 395. *Health Education for the Classroom Teacher.* ★3 (either term, 3-0-0).

HE ED 397. *Family Life Education for Secondary Schools I.* ★3 (First Term, 3-2s-0).

HE ED 399. *Family Life Education for Secondary Schools II.* ★3 (Second Term, 3-2s-0). A study of aspects of family life education with an emphasis on understanding self and relationships with family members. Prerequisite: HE ED 397.

P ED 405. *Comparative Physical Education and Sport.* ★3 (either term, 3-0-0). An examination of physical education and sport in selected countries.

P ED 408. *Introduction to Research.* ★3 (Second Term, 3-0-0). An examination of research techniques and designs with special emphasis on interpreting research literature in physical education. Prerequisite: P ED 208.

P ED 425. *Gymnastics Coaching.* ★3 (either term, 3-0-0). Designed to provide theory of and experience in a variety of technical aspects of gymnastics, including coaching, spotting, officiating, judging and meet administration. Successful completion of course gives participant Technical Level II Certification. Prerequisite: P ED 225 or consent of the Department.

P ED 427. *Principles of Aquatic Instruction.* ★3 (either term, 3-0-0). The course will include practical and theoretical sessions on aquatic instructional techniques. Advanced skill development will also be pursued. Course work includes certification at the Instructor's level. Prerequisites: P ED 327 or RLSS Bronze Medallion or the equivalent in swimming skills.

P ED 428. *Coaching Competitive Swimming.* ★3 (either term, 3-0-0). The course is designed to introduce the student to competitive coaching techniques and skills working towards National Coaching Certification (Technical Level I). Prerequisites: P ED 327, 427 or equivalent.

P ED 440. *Practicum in Physical Education for the Physically Disabled.* ★3 (both terms, 1-0-2). Supervised experience in physical activity programs for the physically disabled. Prerequisite: P ED 240 and consent of the Department. (For B.P.E. students only.)

P ED 450. *Advanced Analysis of the Administration of Sport and Physical Education Programs.* ★3 (First Term, 3-0-0). Theoretical considerations for the organization and administration of sport and physical education programs. Prerequisites: P ED 250 and P ED 350. (For B.P.E. students only.)

P ED 460. *Advanced Coaching Practicum.* ★3 (both terms, 2.5-0-0). Advanced coaching experience under the direction of or in association with an approved coach. Prerequisite: P ED 360.

P ED 461. *Psychology of Coaching.* ★3 (either term, 3-0-0). The direct implications of basic scientific psychological principles underlying the coaching of both individual and team sports for pre-adolescent and adolescent children. Prerequisite: P ED 303 or consent of the Department.

DANCE 470. *Dance Practicum.* ★3 (both terms, 2-0-0). Guided theoretical and practical experiences in the areas of choreography, performance and production. Prerequisite: DANCE 270, DANCE 371, DANCE 372, or consent of the Department.

P ED 480. *Practicum in Outdoor Leadership and Group Processes.* ★3 (both terms, 2.5-0-0). A practicum and personal assessment in group leadership experience in an outdoor education agency situation, to be arranged with the outdoor education consultant. In addition to the agency placement, students are expected to participate in the fourth year professional term expedition leadership experience. Prerequisite: P ED 381 or P ED 382, or consent of the Department. (For B.P.E. Outdoor Education Route Students only).

P ED 481. *Practicum — Outdoor Skills Development.* ★3 (both terms, 2.5-0-0). Development of personal understandings and skills through recognized and approved outdoor skills training courses, e.g., Outward Bound, NOLS, ARCA Canoe Instructor Program and the Blue Lake Centre. Skills may also be developed through extended wilderness experiences. Prerequisite: P ED 280 or REC 280, or consent of the Department. Students will be expected to bear the costs of off-campus experiences and the optional certification fee.

P ED 491. *Advanced Conditioning.* ★3 (either term, 3-0-0). Theoretical basis of conditioning programs. Emphasis on metabolic and physiological rationale for selected regimens. Prerequisites: P ED 290 and P ED 302 or consent of Department.

HE ED 491. *Community Health I.* ★3 (First Term, 3-2s-0). An introduction to community health problems. Prerequisites: HE ED 391 and HE ED 393 or consent of the Department.

P ED 492. *Advanced Athletic Training Methods and Techniques.* ★3 (either term, 3-0-0). Advanced prevention, treatment, and rehabilitative methods and techniques in athletic training. Prerequisites: P ED 204, 206 and 290.

HE ED 493. *Community Health II.* ★3 (Second Term, 3-2s-0). A detailed analysis of problems related to community health and their relationship to the school. Prerequisite: HE ED 491.

HE ED 495. *Seminar in Elementary School Health Education I.* ★3 (First Term, 0-3s-0). An advanced examination of principles and practices of health education applied to elementary school education. Prerequisite: HE ED 395 or consent of the Department.

HE ED 497. *Seminar in Elementary School Health Education II.* ★3 (Second Term, 0-3s-0).

P ED 499. *Directed Studies.* ★3 (single term, 0-3s-0) A course designed to meet the needs of individual students. Prerequisite: Consent of the Department.

154.3 Courses in the B.A. in Recreation Administration Program

154.3.1 COURSES

NOTES:

1. Priority will be given to recreation students in all recreation courses that are required for completion of the B.A. (Recreation Administration) Degree Program.

2. All out-of-department students are required to complete REC 451 (Community Recreation) before they may take any other recreation course.

3. Where an appropriate background can be demonstrated, REC 451 and other prerequisites may be waived, with the consent of the Department.

REC 255. *Introduction to Recreation and Leisure.* ★3 (First Term, 3-0-0). An introduction to the role of recreation and leisure in modern society. Examination of the field of recreation in terms of career opportunities and potential for academic study. An overview of the structure of the Canadian recreation delivery system. (Recreation students only).

REC 257. *Methods and Materials for Recreation Instructors.* ★3 (either term, 3-0-2). Introduction to organizing settings, activities, participants and leadership to produce recreation experiences. Emphasis upon practical skills in organizing and conducting programs.

REC 280. *Introduction to Outdoor Recreation.* ★3 (either term, 3-0-6). Use and understanding of the outdoor environment as a recreation setting. Emphasis on experimental learning. Note: REC 280 and P ED 280 may not both be taken for credit. A user fee of $10 is charged for maintenance of equipment. A fee of up to $40 per student will be charged to contribute to field trip expenses.

REC 301. *Planning for Leisure: Principles and Processes.* ★3 (either term, 3-0-0). Examination of the planning process with particular reference to the roles of recreation administrators, professional planners, and citizens in planning for leisure opportunities. Prerequisite: REC 255 (or REC 451); REC 257.

REC 345. *Interpersonal Relations in Recreation Practices.* ★3 (either term, 3-0-0). Examination of interpersonal and group skills necessary for effective leadership in recreation practice. Formerly REC 367. Prerequisites: REC 255 (or REC 451); REC 257.

REC 350. *Philosophies of Leisure and Recreation.* ★3 (either term, 3-0-0). Examination of the historical evolution of selected philosophies of leisure and recreation in Western civiliza-

tion, their relationships to ideas about work, play, and quality of life, their implications for the recreation profession in Canada, and their impact upon future development of Canadian society. Formerly part of REC 355. Prerequisites: REC 255 (or REC 451).

REC 351. *History of Recreation in Canada.* ★3 (either term, 3-0-0). Overview of the development of recreation in Canada through volunteer associations, voluntary and private agencies, and through municipal, provincial and federal government parks and recreation agencies: 1800 to the present. Formerly part of REC 355. Prerequisites: REC 255 (or REC 451); REC 350.

REC 359. *Methods and Materials for Recreation Practices.* ★3 (either term, 3-0-1). Design, implementation and evaluation of small scale recreation programs. Prerequisites: REC 301; REC 345.

REC 363. *Public Relations for Recreation Agencies.* ★3 (First Term, 3-0-0). Principles of public relations, including communications, modification of attitudes, identification of differing publics, and ethical issues, as they apply to the recreation field. Opportunity to write newspaper and magazine articles. Prerequisites: REC 350, REC 351.

REC 365. *Sport and the Community.* ★3 (Second Term, 3-0-0). Emphasis upon the values and policies underlying articulated community, provincial and national sports development programs, with a special concern for extending the playing life span of sports participants. Examination of the social, psychological and cultural roles of sports in society. Prerequisites: REC 350; REC 351. A minimum of 2 basic sociology courses is recommended.

INT D 366. *Economics of Outdoor Recreation.* ★3 (Second Term, 3-0-0). Economic implications of outdoor recreation and use with emphasis on location and time factors, and consumer activities and expenditures. Benefit-cost evaluation of outdoor recreation resource use in the context of multiple land use, with public guidelines for privately and publicly-owned recreation resources. Prerequisite: ECON 201. (Offered jointly by the Departments of of Rural Economy, Forest Science, and Recreation Administration.) [Rural Economy].

REC 371. *Introduction to Recreation for Special Groups.* ★3 (either term, 3-0-1). Overview of the historic aspects of recreation for special groups. The nature of such groups and the rationale of service to them. The roles of recreation practioners in serving special groups. The current status of these groups. Prerequisites: REC 301; REC 350. Note: REC 371 and P ED 240 may not both be taken for credit.

REC 390. *Outdoor Programming and Counselling.* ★3 (First Term, 3-3-3). Examination of the range and depth of recreation experiences inherent in selected outdoor activities and settings, and their implications for direct programming and counselling. Note: A user fee of $10 is charged for maintenance of equipment. A fee of up to $40 per student will be charged to contribute to field trip expenses. Prerequisite: REC 280 (or P ED 280).

REC 435. *Outdoor Recreation Resources.* ★3 (Second Term, 3-0-1). Ethics of land use; patterns and trends in outdoor recreation; extent of outdoor resources for recreation use; characteristics of wilderness users; resource allocation and development by provincial agencies; and public participation in the decision-making process for resource allocation. Prerequisite: REC 301.

REC 441. *School-Community Recreation.* ★3 (First Term, 3-0-0. Overview of community education as a social movement; integration of community recreation and education. Emphasis is upon four themes: theoretical perspectives; characteristics of the social movement; strategies for implementation; and current trends and issues. Prerequisites: REC 350; REC 351.

REC 443. *Staging Major Community Events.* ★3 (Second Term, 3-0-0). The underlying philosophy for, and the planning and staging of, major community events. Particular attention is given to cultural and political processes. Prerequisites: REC 351. A minimum of 1 drama course is recommended.

REC 451. *Community Recreation.* ★3 (either term, 3-0-0). An orientation to the field of recreation. Examination of the principles of recreation and leisure, the dimensions of recreation practice, and career potential, in the recreation field. Note: Open to students from other departments, after degree students, and mature students transferring into Recreation Administration. Prerequisite: Consent of the department. Note: REC 255 and REC 451 may not both be taken for credit.

REC 455. *Recreation Administration: The Canadian Context.* ★3 (either term, 3-0-0). Examination of the Canadian public sector agencies in which the practice of recreation administration occurs. Prerequisite: REC 301.

REC 457. *Fieldwork in Recreation.* ★3 (either term, 0-2/2-12). A supervised placement for 3rd year B.A. (Recreation Administration) students. (Recreation students only). Prerequisite: REC 301; REC 345.

REC 458. *Senior Seminar.* ★3 (either term, 3-0-0). A seminar for graduating students in Recreation Administration centering upon issues relevant to the beginning professional. The seminar seeks to provide a synthesis appropriate to the final year student. (Recreation students only). Note: Must be taken in the graduating term.

REC 459. *Planning Recreation Facilities.* ★3 (either term, 3-0-1). Examination of the process and content of planning for recreation from the community level to the individual facility. Prerequisite: REC 301.

REC 463. *Parks Operation and Maintenance.* ★3 (First Term, 3-0-1). Examination of the administrative and technical operations of park systems. Development of basic skills necessary for effective and efficient administrative and maintenance operations in a park system. Prerequisites: REC 301. REC 435 and REC 459 recommended.

REC 465. *Community Organization Processes.* ★3 (either term, 3-0-0). Analysis of the social and political processes through which groups and individuals work to mobilize resources and establish relationships to fulfill community needs. Prerequisites: REC 301; REC 345.

INT D 466. *Principles of Heritage Interpretation.* ★3 (First Term, 3-0-0). Examination of heritage interpretation as an expression of cultural and environmental recreation programs. Prerequisite: Consent of instructor. (Offered jointly by the Departments of Forest Science and Recreation Administration.) [Recreation Administration].

INT D 467. *Methods of Heritage Interpretation.* ★3 (Second Term, 3-0-0). Application of principles of interpretation of natural and historic resources. Focus on management techniques, development of facilities and interpretative programs. Case studies and field trip. Prerequisites: Consent of instructor; INT D 466 is recommended. (Offered jointly by the Departments of Forest Science and Recreation Administration.) [Forest Science].

REC 469. *Administrative Practices in Recreation.* ★3 (either term, 3-0-0). Analysis of principles and practices in the management of recreation agencies and programs. Prerequisite: REC 301.

INT D 469. *Plans for Heritage Interpretations.* ★3 (Either Term, 2-0-3). Survey of principles and practices at various levels of interpretative planning in historical/cultural and natural environments. (Offered jointly by the Department of Forest Science and Department of Recreation Administration normally in the Spring or Summer terms.) [Recreation Administration].

INT D 470. *Field Trip in Heritage Interpretation.* ★3 (Either Term, 0-2-6). Extended field trip to examine comparatively the philosophies, approaches and applied methodologies of a diverse range of institutions and agencies engaged in the provision of heritage interpretation programs. (Offered jointly by the Department of Forest Science and Department of Recreation Administration, normally in the Spring or Summer terms.) [Forest Science]. Prerequisite: INT D 466, and/or 467, and/or 469, or consent of instructor.

REC 471. *Recreation Services for Special Groups.* ★3 (Second Term, 3-0-2). An in-depth review of selected groups labelled as "special" in today's society. Consideration of the implications for the delivery of recreation and related services. Examination of current issues and future trends related to associations, institutions and community services for special groups in Alberta and Canada. Formerly REC 373. Prerequisite: REC 371.

REC 477. *Practices and Procedures for Research in Recreation.* ★3 (First Term, 3-0-0). Interpretation of some of the more common methods and some of the findings of research in the field of recreation. Guidelines for the definition of researchable questions. Examination of practices and procedures for the direction and conduct of research in recreation. Prerequisites: REC 301; SOC 311 or equivalent.

REC 479. *Analysis and Interpretation of Recreation Research.* ★3 (Second Term, 3-0-0). Analysis of the interpretation and

use of research for the planning and administration of recreation services and facilities. Prerequisite: REC 477.

REC 489. *Selected Topics.* ★3 (either term, 3-0-0). Topics of current interest in leisure and recreation. Prerequisite: Consent of instructor.

REC 490. *Cultural Arts Administration.* ★3 (Second Term, 3-0-0). Introduction to the administration of cultural arts programs from the perspective of the leisure/recreation delivery system, the artists, and the administrators of such programs. Prerequisite: REC 469.

REC 499. *Directed Study.* ★3 (either term, 3-0-0). Individual or group study on a theme or issue in recreation, carried out under the direction of a member of the academic staff. (Open to Recreation students only). Note: May be taken by 4th year students only.

154.3.2 PATTERN RELATED AND APPROVED OPTIONS FROM OTHER DEPARTMENTS AND FACULTIES

Pattern related and approved options recommended by the Department of Recreation Administration can be found in the Program Guide, available upon request from the Department office, Room W1-08, Physical Education and Recreation Centre.

154.4 Courses in the Department of Movement Education

MOV 201. *Introduction to the Movement Activities of Children Aged 0-8.* ★3 (either term, 0-6L-0). A study of play and other movement activities including games, gymnastics and dance for children.

MOV 202. *Introduction to the Movement Activities of Children Aged 8-12.* ★3 (either term, 0-6L-0). A study of games, gymnastics, dance and other movement activities for children.

MOV 244. *Introduction to the Movement Activities of Youth, Part I.* ★3 (First Term, 1-2s-0). A study of a wide range of physical activities and the related underlying concepts.

MOV 245. *Introduction to the Movement Activities of Youth, Part II.* ★3 (Second Term, 1-2s-0). A continued study of physical activities and the related underlying concepts. Prerequisite: MOV 244.

MOV 301. *Motor Development and Motor Learning.* ★3 (either term, 3-0-0). Lecture course focusing on important relationships between human physical growth and development; and environmental factors that influence the acquisition of motor skills.

MOV 321. *Structure and Strategy of Games.* ★3 (First Term, 1-2s-0). A study of games; their classification with regard to skills, rules and strategies through practical and theoretical experiences.

MOV 325. *Introduction to the Scientific Basis of Human Movement.* ★3 (either term, 3-0-0). Lecture course with emphasis on introductory knowledge and practical implications of the structural and functional characteristics and capacities of the human body with respect to movement.

MOV 327. *Creative Dance.* ★3 (either term, 1-2s-0). A study of the application of Laban's principles of Movement in dance. The individual's understanding of these principles is extended through personal performance.

MOV 351. *Educational Gymnastics.* ★3 (either term, 1-2s-0). Gymnastics themes are studied and used to develop efficient movement through practical work in individual and group situations.

MOV 369. *Curriculum and Instruction in Aquatics and Ice Activities, K-VI.* ★3 (Second Term, 0-3L-0). Prerequisite: MOV 201 or MOV 202 or consent of the Department.

MOV 379. *Curriculum and Instruction in Track and Field and Organization of Sports Activities, K-VI.* ★3 (First Term, 0-3L-0). Prerequisite: MOV 202 or consent of the Department.

MOV 411. *Movement Activities of Children Aged 0-12.* ★3 (Second Term, 1-2s-0). Prerequisite: open to fourth year students with no previous Movement Education courses, or with consent of the department. (Not offered during 1981-82 academic year).

MOV 419. *Issues in Movement Education.* ★3 (Second Term, 0-3s-0). Prerequisites: MOV 201, 202, 321, 325, 327, and 351.(Not offered during 1981-82 academic year).

MOV 421. *The Study of Games for Children.* ★3 (Second Term, 2-4s-0). A study in depth of the games played by children in informal situations and in organized programs. Opportunities or observe and work with children will be provided. Prerequisites: One or more of MOV 201, 202, 321 or consent of department.

MOV 423. *Creative Dance for Young Children.* ★3 (First Term, 2-4s-0). A study of creative dance as an integral aspect of the aesthetic and creative education of the child up to eight years of age. The interrelationships of creative dance with the young child's use of language, rhyme, story, music and painting will be examined. Prerequisite: MOV 201 or consent of department.

MOV 427. *A Study of Dance for Children.* ★3 (Second Term, 2-4s-0). A study in depth of the three interrelating components of children's dance: the child as the creator, performer and spectator. Opportunities to observe, work with and perform for children will be provided. Prerequisites: One of more of MOV 201, 202, 327, 423, DANCE 270 or consent of department.

MOV 433. *Movement Education for Young Children.* ★3 (Second Term, 2-4s-0). A study of the functional aspects of movement as related to the activities of children to eight years of age. The course includes a study of play equipment and play spaces. Prerequisite: MOV 201 or consent of department.

MOV 451. *The Study of Gymnastics for Children.* ★3 (First Term, 2-4s-0). A study in depth, of the sequential development of gymnastics and related programs for children. Planning, presenting and evaluating the activities of children will be an extensive part of this course. Prerequisites: One or more of MOV 201, 202, 351 or consent of department.

MOV 499. *Independent Study.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

154.5 Graduate Courses

Graduate-level courses offered by the Department of Physical Education:

P ED 501. *Research and Directed Studies.* ★3 (First Term, 0-3s-0).

P ED 503. *Research and Directed Studies.* ★3 (Second Term, 0-3s-0).

P ED 507. *Graduate Seminar: A Seminar in Current Factors, Problems and Issues.* ★3 (either term: to be arranged, 0-3s-0).

PHYSL 507. *Thermoregulation and Energy Exchange.* ★3 (Second Term, 1-2s-0). Prerequisite: Introductory physiology course or consent of the Department.

P ED 541. *Anthropometry and Physical Activity.* ★3 (1-2s-0). An examination of current research in anthropometry and body composition with special emphasis on obesity and weight control.

P ED 543. *Exercise Physiology Laboratory Techniques.* ★3 (First Term, 2-0-4). Prerequisite: Consent of the Department.

P ED 544. *Popular Physical Culture and Social Interaction.* ★3 (First Term, 1-2s-0).

P ED 545. *Sport and Society.* ★3 (Second Term, 1-2s-0).

P ED 546. *Psychosocial Aspects of Women In Sport.* ★3 (First Term, 0-3s-0). An examination of the role and significance of women in sport from a psychosocial research perspective.

P ED 547. *Exercise Testing and Exercise Prescriptions.* ★3 (First Term, 1-1s-2).

P ED 549. *Behavioral Analysis of the Athlete.* ★3 (either term, 0-3s-0). Prerequisite: P ED 303 or consent of the Department.

P ED 551. *Administrative Problems in Sport and Physical Education and Recreation.* ★3 (First Term, 1-2s-0).

P ED 553. *Administration of Sport and Physical Education Programs.* ★3 (Second Term, 1-2s-0).

P ED 561. *Seminar in Biomechanics.* ★3 (either term, 0-3s-0).

P ED 567. *Seminar in Human Motor Performance.* ★3 (Second Term, 0-3s-0). Selected topics of current interest in the field of human motor performance.

P ED 569. *Physical Growth and Development.* ★3 (First Term, 0-3s-0). An examination of selected topics in physical growth and motor development from both a theoretical and applied perspective.

P ED 571. *Seminar in Sport Sciences.* ★3 (First Term, 0-3s-0).

P ED 573. *Adapted Physical Education.* ★3 (Second Term, 0-3s-0). Seminar on current theoretical, practical and research issues related to program implementation in adapted physical education.

P ED 575. *Muscular Strength and Endurance.* ★3 (either term, 0-3s-0). Study of muscle contraction with emphasis on underlying mechanisms for improved functioning of cardiac and skeletal muscles.

P ED 577. *The Nature of Scientific Inquiry in Physical Education and Recreation.* ★3 (First Term, 1-2s-1). An introduction to the basic philosophy and nature of scientific inquiry as it applies to contemporary research.

P ED 578. *Social Research Applications to Sport.* ★3 (Second Term, 0-3s-0). An examination of both quantitative and qualitative research methodologies as they apply to the sociology of sport.

P ED 587. *Cross-Cultural Comparative Analysis of Sport and Physical Recreation.* ★3 (First Term, 1-2s-0). An examination of sport and physical recreation in selected cultures with emphasis on the ramifications for Canada.

P ED 589. *Sport Under Socialism.* ★3 (Second Term, 1-2s-0). An examination of physical education programs in selected cultures with emphasis on the ramifications for Canada.

P ED 591. *Pre-Renaissance Sport and Physical Education.* ★3 (First Term, 1-2s-0).

P ED 593. *Rise of Modern Sport and Physical Education.* ★3 (Second Term, 1-2s-0).

P ED 599. *Directed Studies and Research.* ★3 (both terms, 0-1.5s-0).

P ED 601. *Directed Studies and Research.* ★3 (First Term, 0-3s-0).

P ED 603. *Directed Studies and Research.* ★3 (Second Term, 0-3s-0).

P ED 651. *Issues in Exercise Physiology.* ★3 (either term, 0-3s-0). Seminar course dealing with current developments and controversial issues in the field of exercise physiology.

P ED 653. *Physiological Factors Affecting Performance.* ★3 (Second Term, 0-3s-0). Limited to Ph.D. students in Exercise Physiology or consent of the Department.

P ED 655. *Energy Mobilization and Training.* ★3 (Second Term, 0-3s-0). Cellular adaptations to acute and chronic exercise. Discussion of metabolic and structural adaptations during exercise.

P ED 657. *Seminar in Exercise Physiology.* ★3 (Second Term, 0-3s-0).

P ED 661. *History of Sport I.* ★3 (Second Term, 0-3s-0).

P ED 662. *Seminar in Comparative Physical Education and Sport.* ★3 (either term, 0-3s-0). The examination and development of conceptual frameworks for analyzing sport and physical education in selected nations of the world.

P ED 663. *Seminar in History of Sport and Physical Education Before 1800.* ★3 (Second Term, 0-3s-0).

P ED 665. *Seminar in the History of Sport and Physical Education Since 1800.* ★3 (First Term, 0-3s-0).

P ED 667. *History of Sport and Physical Education in Canada.* ★3 (Second Term, 0-3s-0).

P ED 669. *Advanced Seminar in Growth and Development.* ★3 (either term, 0-3s-0). An advanced study of the research and theories of development of human motor performance related to maturation and environmental conditions.

P ED 673. *Advanced Seminar: Theory in Human Motor Performance.* ★3 (First Term, 0-3s-0).

P ED 675. *Advanced Seminar: Research and Design in Human Motor Performance.* ★3 (Second Term, 0-3s-0).

P ED 695. *Advanced Seminar in Biomechanics.* ★3 (either term, 0-3s-0).

P ED 699. *Directed Studies and Research.* ★3 (0-1.5s-0).

P ED 900. *Non-Thesis Project.* ★6 (Variable). A major piece of scholarly writing.

Graduate-level courses offered by the Department of Movement Education:

MOV 530. *Program Development in Elementary School Physical Education.* ★6 (3-0-0). Prerequisite: Consent of the Department

MOV 581. *Planning and Conducting Movement Activities for Adults.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

MOV 599. *Directed Study.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

Graduate-level courses offered by the Department of Recreation Administration:-

REC 477. *Practices and Procedures for Research in Recreation.* ★3 (Second Term, 3-0-0). Interpretation of some of the more common methods and some of the findings of the research in the field of recreation. Guidelines for the definition of researchable questions. Examination of practices and procedures for the direction and conduct of research in recreation. Prerequisite: SOC 311 or equivalent.

REC 500. *Theory and Practice of Public Recreation Administration.* ★3 (First Term, 3-0-0). Examination of the processes and dimensions of administrative practice in public agencies delivering recreation services, the theoretical base being drawn from the general field of administration and from the behavioural sciences.

REC 501. *Directed Study.* ★3 (First Term, 3-0-0). Detailed study of a theme, issue or concern in the field of recreation. Designed to meet the needs of individual students.

REC 503. *Directed Study.* ★3 (Second Term, 3-0-0). Detailed study of a theme, issue or concern in the field of recreation. Designed to meet the needs of individual students.

REC 511. *Historical Foundations of Public Recreation in Canada.* ★3 (First Term, 3-0-0). Examination of the development of public recreation in Canada, with an overview of recreation development in the United States and other countries that have had a major influence in the shaping of public recreation services in Canada.

REC 531. *Socio-Psychological Dimensions of Recreation Involvement.* ★3 (Second Term, 3-0-0). Examinations of personal and situational factors related to involvement in recreation pursuits. Emphasis upon the general nature of the recreation experience and the significant factors affecting it.

REC 551. *Public Recreation Services Policy and Planning.* ★3 (Second Term, 3-0-0). Examination of policy making and planning processes as they relate to the delivery of public recreation services in Canada. Draws upon the theoretical base of political science, upon decision making theories and upon the principles of planning in analysing policies and plans in the public recreation field.

REC 599. *Directed Study.* ★3 (1.5-0-0). Detailed study of a theme, issue or concern in the field of recreation. Designed to meet the needs of individual students.

(Standing, left to right) Dr. David Magee, Chairman of Physical Therapy; Dr. Ronald Fahey, Chairman of Speech Pathology and Audiology. (Seated, left to right) Ms Helen Madill, Chairman of Occupational Therapy; Dr. Frank B. Wilson, Dean

Faculty of Rehabilitation Medicine

161 INTRODUCTORY

161.1 Members of the Faculty

161.1.1 STAFF

Professor and Dean
F. B. WILSON, Ph.D., F.A.S.H.A.

161.1.2 DEPARTMENT OF OCCUPATIONAL THERAPY

Associate Professor and Chairman
H. M. MADILL, M.Ed., B.O.T., Dip.O.T. (N.S.W.), T.Dip.

Associate Professors
L. G. ALLBON, B.O.T., M.B.A.O.T., T.Dip.
E. S. BRINTNELL, B.O.T., Dip.P. and O.T.
B. B. FIFIELD, B.O.T., M.B.A.O.T., T.Dip.
J. W. VARGO, Ph.D.
P. WOOD, Ph.D. OTR

Assistant Professor
J. GILLESPIE, M.A.

Lecturer
M. WALLEY, B.O.T.

Sessional Lecturers
S. DENNIS, M.A.
A. MAGNAN, B.O.T.
S. McDONALD, Ph.D.
P. McKEE, B.Sc.
S. WILSON, B.Sc.

Honorary Clinical Teaching Associate
G. MONCKTON, M.D., M.R.C.P.

Clinical Teaching Associates
R. BLAND, M.D., F.P.C.P.(c)
W. M. RIGAL, M.B., Ch.B., Ph.D., F.R.C.S.

161.1.3 DEPARTMENT OF PHYSICAL THERAPY

Chairman and Associate Professor
D. J MAGEE, B.A., B.P.T., M.Sc., Ph.D., M.C.P.A.

Professor Emeritus
A. G. FAULDS, M.C.S.P., Dip.T.P.

Associate Professors
S. KUMAR, Ph.D.
K. R. MALCOLM, B.P.T., M.C.S.P., M.C.P.A., Dip.T.P.
M. J. PARKER, M.C.S.P., H.T., M.C.P.A., Dip.T.P.
H. E. SEMPLE, M.Ed., B.P.T., M.C.S.P., H.T., M.C.P.A., Dip.T.P.

Assistant Professors
D. M. FORD, M.Sc., B.P.T., M.C.P.A., Dip.T.P.
H. KRAMER, B.Sc., M.Sc., Ph.D.

Clinical Teaching Associates
M. BRIGGS, B.Sc., M.C.P.A.
M. CHIBUK, M.Sc.
V. HARRIS, M.C.P.A.
J. LOOMIS, B.P.T., M.C.P.A.
A. MORRISON, M.C.P.A.
D. C. REID, M.D., F.R.C.S.(C), B.P.T., Dip.T.P.
B. ROBINSON, M.C.P.A.
J. WESSEL, M.H.Sc., B.Sc., M.C.P.A.
D. G. YOUNG, M.Sc., M.D.C.M., F.R.C.P.(C)

161.1.4 DEPARTMENT OF SPEECH PATHOLOGY AND AUDIOLOGY

Professor and Chairman
J. N. NEELLEY, Ph.D.

Professors
E. BOBERG, Ph.D.
F. B. WILSON, Ph.D., F.A.S.H.A.

Associate Professors
R. FAHEY, Ph.D.
K. GOUGH, Ph.D.
G. HOLDGRAFER, Ph.D.

Assistant Professor
P. HAGLER, M.A.

Honorary Clinical Teaching Associates
F. GREENBERG, Ph.D.
P. KILENY, Ph.D

Clinical Teaching Associates
J. BRANCH, M.A.
B. MANSELL, M.S.
D. STENSLAND, M.A.

161.1.5 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Associate Dean
G. MAHRT, Ph.D. (Science)

Professors
G. KYSELA, Ph.D. (Educational Psychology)
G. MONCKTON, M.D. (Medicine)

Associate Professors
K. D. McFADDEN, Ph.D. (Anatomy)
B. K. SINHA, Ph.D. (Psychology)

Registrar of the University

Representatives
I. HENDERSON, Speech and Hearing Association of Alberta
B. GOLDBERG, Alberta Association of Registered Occupational Therapists
M. BRIGGS, Association of Chartered Physiotherapists of Alberta
Dr. R. FELDMAN, Rehabilitation Committee, Alberta Medical Association

161.2 General Information

The importance of Medical Rehabilitation was recognized by the University establishing a program in Physical Therapy in 1954, and a program in Occupational Therapy in 1960. The Division of Speech Pathology and Audiology first offered courses in 1969.

Undergraduate Programs — Four-year degree programs are offered in all three Departments of the Faculty. Applicants to the Department of Speech Pathology and Audiology and the Department of Occupational Therapy are required to complete a pre-professional year prior to enrolling in those programs. All students are required to undertake clinical practice during their course of study in approved institutions under the supervision of qualified professional staff. An honorarium may be paid by the institutes concerned while the student is serving the internship during the summer months.

Programs for Master's Degrees — Master's of Science in Physical Therapy: The Department of Physical Therapy offers an advanced program in research techniques, orthopaedics, sports therapy, therapeutic exercise and other Physical Therapy specialty areas. The program normally requires two years but the time may vary according to the academic background of each student. Applicants must normally have had at least one year of clinical experience prior to being accepted into the program. It is possible to enter the program in January, May or September.

For further information write to: Chairman, Graduate Committee, Department of Physical Therapy, Faculty of Rehabilitation Medicine, University of Alberta, Edmonton, Alberta, T6G 2G4.

161.3 Licensing by Professional Associations

161.3.1 OCCUPATIONAL THERAPY

Graduates from the B.Sc. in Occupational Therapy program are eligible to apply for membership in the Canadian Association of Occupational Therapists, 25 Imperial Street, Toronto, Ontario, M5P 1B9, and the Alberta Association of Registered Occupational Therapists, 310 Corbett Hall, University of Alberta, Edmonton, Alberta, T6G 2G4.

161.3.2 PHYSICAL THERAPY

Graduates from the B.Sc. in Physical Therapy program are eligible to apply for membership in the Canadian Physiotherapy Association, 25 Imperial Street, Toronto, Ontario M5P 1B9 and the Association of Chartered Physiotherapists of Alberta, 10 - 10444-82 Avenue, Edmonton, Alberta.

161.3.3 SPEECH PATHOLOGY AND AUDIOLOGY

It is expected that all graduates will make application for membership in the Canadian Speech and Hearing Association, c/o Department of Speech Pathology and Audiology, Room 308, Corbett Hall, University of Alberta, Edmonton, Alberta, T6G 2G4, and the Speech and Hearing Association of Alberta.

161.3.4 PROVINCIAL LICENSING

Graduates from all programs intending to practice in Canada will have to comply with provincial licensing requirements regardless of their professional qualifications.

161.3.5 EMPLOYMENT IN OTHER COUNTRIES

Information regarding practice in other countries may be obtained from the appropriate professional organization, which will also advise on the degree of reciprocity of registration to be expected.

161.4 Budget

An estimated annual budget of approximately $3,900 will be required by a student who is not able to live at home. This includes room and board, books, tuition fees, student fees, travelling expenses and other incidentals.

In the Department of Occupational Therapy a Laboratory Fee of $15.00 will be charged in the second and third years of the program. A charge for materials used will be made in succeeding years.

In the Department of Physical Therapy a fee of $15.00 will be charged for materials and supplies to all full-time students registered in the program.

In the Department of Speech Pathology and Audiology, fees in the amount of $10.00 will be charged for materials and supplies in each year of the program.

162 FACULTY REGULATIONS

162.1 Admission

162.1.1 GENERAL INFORMATION

Owing to severe limitations of space and to the present shortage of clinical placement centres, admission into all programs is on a quota system: thirty-six students in the Occupational Therapy program; forty in Physical Therapy; and twenty-five in Speech Pathology and Audiology.

Although selection procedures will vary with the program offered, in general the emphasis will be upon academic standing with preference being given to those applicants with the highest standing.

As admission requirements vary with the program selected, it is imperative that those wishing to apply consult the matriculation requirements as set out in § 13.17 of the University Regulations and Information for Students Calendar.

Applications for admission to the faculty must be received by *May 1*. Applicants can expect to be informed of their status following receipt of high school results, generally in the latter part of August.

Upon notification of acceptance successful applicants will be required to confirm their intention to register by submitting a non-refundable $50.00 deposit within a specified time. The deposit will be credited toward payment of tuition upon completion of registration.

Academic Standings: It is the responsibility of applicants to ensure that official transcripts of their academic marks from high school or university are submitted to the Registrar's Office. In the case of university transfer, these transcripts must be received no later than July 3, 1981.

English Language Proficiency: English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

1. Successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. Presentation of a successfully completed full year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;

3. Successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by The University of Alberta;

4. Successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education; or

5. Presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

162.1.2 OCCUPATIONAL THERAPY

Those individuals wishing to enroll in the B.Sc. O.T. program will be required to complete a pre-professional year prior to applying for admission to the faculty. Students entering The University of Alberta from high school shall enroll in the faculty of their choice and shall then apply for admission after successful completion of first year University.

Admission to the second year of the O.T. program will be based on academic performance in the first year of university study, including OCCTH 207/208, as well as completion of a satisfactory interview with a representative of the department. Preference will normally be given to those students with the highest overall standing and who have completed a full course load during one academic session. Required courses in the pre-professional year are PSYCO 260/261 or their equivalent, one full laboratory science, and OCCTH 207/208.

Students must contact the O.T. office no later than May 1st to arrange for their interview in order to be considered for the next academic year.

The above regulations shall also apply to those students with university experience in addition to that required. Advanced standing may be granted, but students will be required to carry a full course load for the last three years of the B.Sc. O.T. program (minimum of 5 full courses). Each application will be examined on its own merits, taking into consideration academic standing in courses previously taken and the personal interview. Under normal circumstances, an individual with a previous degree will be granted advanced standing for up to a maximum of 6½ full courses in order to meet the requirements for a B.Sc. in O.T.

162.1.3 PHYSICAL THERAPY

(1) *Requirements for Basic Four-Year Program*

All applicants should contact the Physical Therapy Department office for clarification of admission procedures for 1981-82.

Applicants to the first year of the Physical Therapy program will be admitted on the basis of:

(a) *Academic standing.*

(b) *The Allied Health Professions Admission Test.*

Applicants will be scored on academic standing and results of the admissions test, with preference given to those with the highest standing on the composite score.

Allied Health Professions Admission Test (A.H.P.A.T.): All North American applicants to the Physical Therapy program will be required to write the *Allied Health Professions Admission Test* and have their scores forwarded to:

Chairman, Department of Physical Therapy
Faculty of Rehabilitation Medicine
The University of Alberta
Edmonton, Alberta
T6G 2G4

It will be the responsibility of the applicant to undertake all arrangements for the writing of the test and the forwarding of results to the Department of Physical Therapy. Application forms may be obtained from the Department of Physical Therapy or by writing to:

Allied Health Professions Admission Test
The Psychological Corporation
304 East 45th Street
New York, N.Y. 10017
Phone (212) 754-3221.

The *Allied Health Professions Admission Test* may be taken in either Edmonton or Calgary. Applicants from other provinces in Canada will find information regarding other testing centres in the test information booklet. Applicants from outside the North American continent will not be required to write the test. It should be noted that the closing date for receipt of applications to take this test is at least four weeks before the test date. Payment for this test should be made, in U.S. funds, directly to the Psychological Corporation.

(c) *Hospital Visit.* All Canadian applicants to the Physical Therapy program will be required to visit at least one hospital department of Physical Therapy and submit a report (on the form supplied by the Department of Physical Therapy at the University) on that visit before June 2, 1981.

(2) *Requirements for Master of Science Program*

To meet the requirements of the Faculty of Graduate Studies and Research, applicants must have a Grade Point Average (G.P.A.) of at least 6.0 in the last two

years of their undergraduate baccalaureate program at The University of Alberta or an equivalent qualification from another institution. Applicants will be judged not only on their academic record, but also on their professional potential as indicated in letters of reference, interviews, and other supportive material; and they must also normally have had at least one year of clinical experience prior to being accepted into the program.

162.1.4 SPEECH PATHOLOGY AND AUDIOLOGY

Those wishing to enroll in the Speech Pathology and Audiology program will be required to complete a pre-professional year prior to applying for admission to the Faculty. Students entering The University of Alberta from high school shall enroll in the faculty of Science or Education* and shall apply for admission after successful completion of first year at the university.

Preference will normally be given to students who have completed a full course load during one academic session.

Required courses in the pre-professional year shall include:

SPA 280
SPA 281
PSYCO 260
PSYCO 261
} or equivalents

BIOL 299 is strongly recommended

For those students who wish to complete the pre-professional year requirements while attending another institution, SPA 280 and 281 will be offered during the Spring Session at The University of Alberta and possibly at other institutions, depending upon demand and feasibility. For further information please direct inquiries to:

Chairman, Department of Speech
Pathology and Audiology,
Room 308, Corbett Hall
Faculty of Rehabilitation Medicine
The University of Alberta,
Edmonton, Alberta, T6G 2G4.

The above regulation shall apply as well to students with previous university experience wishing to enroll in the program. Any questions regarding *transferability of credit* should be directed to the Registrar's Office of the University.

NOTE: Although students must initially enroll in another faculty or institution, those wishing to eventually enter the program will be required to meet the admission requirements as set out in § 13.17.2 of the University Regulations and Information for Students Calendar.

Following successful completion of the above requirements, applicants will be selected on the basis of academic performance, with preference being given to those with the highest standing.

The Department of Speech Pathology and Audiology will appraise the speech and hearing of newly admitted students each September.

*SPA 280/81 will be accepted as credit courses in the Faculty of Science. The Faculty of Education formerly accepted these courses for credit, but recent changes in first year curricula will alter this. Please consult a Faculty of Education advisor for up-to-date information regarding these SPA courses.

162.1.5 ADVANCED STANDING

Those applicants wishing to apply for advanced standing are asked to direct inquiries to the Chairman of the Department concerned. Each application will be examined on its own merits, taking into consideration academic standing and courses previously taken.

162.2 *Academic Standings and Graduation*

(1) *Passing Grade*

Under normal circumstances each student must obtain a grade of no less than 4 in each required course.

(2) *Grade of 3*

A student will be allowed to carry a grade of 3 in one full course or its equivalent during the program in approved electives or optional courses.

(3) *Supplemental Privileges*

Any student in the Faculty of Rehabilitation Medicine who obtains a grade of 3 in a course offered within the Faculty will normally be recommended for a supplemental examination in that course, providing that an overall G.P.A. for the year of 5.0 or over, has been obtained.

(It would still remain the prerogative of Faculty Council to approve or reject the recommendation.)

(4) Should a student fail a fieldwork placement and wish to challenge that decision, the challenge must be submitted in writing by the student to the fieldwork co-ordinator within ten days of the student's receipt of an unsatisfactory report. A hearing will normally take place within 30 days. (Applicable to OCCTH 427 and 429).

(5) *Promotion and/or Continuation*

At the end of each academic year the Council of the Faculty will review the record of each student. A student shall normally obtain a grade point average of 5.0 required for promotion and/or continuation. Specific requirements will be outlined under Section 163 for the respective programs.

(6) That subject to the approval of the Dean, a grade of Incomplete shall normally be used where a student is prevented by illness, domestic affliction or other extreme circumstances from handing in an assignment at the specified time; where this grade has been given the student is required to submit the assignment within ten days after the completion of the series of final examinations in which this particular course was scheduled, except in cases where, at the request of the Department Chairman, the Dean grants an extension of time. Failure to comply with this regulation will result in a grade of 0 for the portion of the course in which the grade of Incomplete was granted.

(7) Students will normally be required to complete all requirements for the award of their undergraduate degree within five years from the date of admission.

(8) Students who were enrolled in undergraduate programs in the Faculty of Rehabilitation Medicine during 1976-77 will normally be required to complete their program prior to September 20, 1981. Degree completion students admitted to the fourth year of the program during or after 1977-78 will normally be required to complete all requirements for the award of their undergraduate degree within two years of the date of admission.

(9) In the Faculty of Rehabilitation Medicine an elective course will be approved if it (a) does not duplicate material covered in any compulsory course in the student's program (b) does not duplicate material covered in the previously approved elective courses (c) is offered at a time where no timetable conflict exists. Permission to take courses in other universities towards meeting the elective requirements of the student's program will normally be granted if the above conditions are met; credit will be granted for approved off-campus courses, providing a grade of 5 or its equivalent is obtained.

(10) *Residence Requirements*

The minimum residence requirement has to be met by a student either by (a) completing a full year's program as a full-time student or (b) completing a full year's program in which three full session courses, or their equivalent, are taken over a twelve-month period, by making use of the Evening, Spring, and/or Summer Sessions.

(11) That for the purpose of granting First Class Standing and for the granting of awards open to students in more than one Department in the Faculty of Rehabilitation Medicine, a full normal academic course load be defined as a minimum of five full courses or their equivalent.

NOTE: Awards within one Department to be administered, according to their individual criteria, by the Department.

162.3 Additional Regulations

(1) *Uniform:* Students in Occupational Therapy and Physical Therapy will be advised of their requirements at the time of registration.

(2) *Internship Fieldwork:* In certain summer periods students are required to intern at approved institutions under the supervision of qualified staff.

(3) Prior to beginning student internship, students in the Department of Physical Therapy are required to hold a valid Basic Cardiopulmonary Resuscitation Certificate.

162.4 Appeals and Grievances

Every student is entitled to have his/her marks reviewed and appeals procedures have been established in the Faculty. In the first instance students should approach the instructor concerned, then if necessary see the Department Chairman.

An appeal may proceed to the Faculty of Rehabilitation Medicine Appeals Committee, and if unresolved may then be taken to the General Faculties Council Academic Appeals Committee. (See § 16.7 of the University Regulations and Information for Students Calendar.)

Deadline

All appeals regarding academic standing must be received in writing by the Dean prior to June 25, following publication of final results.

163 PROGRAMS OF STUDY

163.1 Degree of B.Sc. in Occupational Therapy

Promotion Prerequisites

Under normal circumstances, a student enrolled in Occupational Therapy will not be allowed to take required courses in one year of the program until all of the required courses of the previous year of his/her program have been successfully completed (i.e. all second year required courses are prerequisites to third year required courses).

Repeating students

Repeating students will normally be required to complete a full academic program of five full courses or their equivalent in order to be considered for promotion. However, no student will be required to take more than the normal number of courses to complete his/her program.

Second Year	*Total hours of instruction*
OCCTH 201 (Anatomy)	156
OCCTH 209 (Therapeutic Occupation)	78
OCCTH 211 (Introduction to Physical Medicine, O.T.)	78
OCCTH 304 (O.T., Psychiatry)	39
OCCTH 319 (Life Span Development)	39
OCCTH 328 (Fieldwork)	8 weeks
OCCTH 333 (Medicine and Surgery)	52
OCCTH 334 (Orthopedics)	52
OCCTH 340 (Behavioral Management in O.T.)	39
OCCTH 402 (Self Development and Communication)	39
REC 451 (Recreation)	39
PHYSL 262 (Physiology)	78
Third Year	
OCCTH 316 (Neuroanatomy)	39
OCCTH 401 (Perceptual Motor Development)	39
OCCTH 403 (O.T., Neurology)	39
OCCTH 404 (O.T., Psychosocial Dysfunction)	39
OCCTH 405 (Research Theory in O.T.)	39
OCCTH 415 (Prevocational Assessment)	39
OCCTH 427 (Fieldwork)	180
OCCTH 428 (Fieldwork)	8 weeks
OCCTH 435 (Advanced Psychiatry)	39
OCCTH 436 (Child Dysfunction)	39
OCCTH 445 (Clinical Neurophysiology)	39
SOC 403 (Principles of Sociology)	39
STAT (minimum ½ course)	39
Approved elective	39
Fourth Year	
OCCTH 406 (Applied Research Design in O.T.)	39
OCCTH 429 (Fieldwork)	480
OCCTH 437 (Geriatrics)	39
OCCTH 455 (Seminar, Physical Medicine)	39
OCCTH 456 (Seminar, Psychiatry)	39
Approved elective	39
Approved elective	39
Approved elective	39

Fourth year Occupational Therapy students will be required to attend a three hour clinical practice discussion on the day that advance registration is to be confirmed.

163.2 The Degree of B.Sc. in Physical Therapy

(1) Under normal circumstances, a student enrolled in physical therapy will not be allowed to take required courses in one year of the program until all the required courses of the previous year of his/her program have been successfully completed.

(2) *First year students*

All students enrolled in the first year of the program will be required to register in, and successfully complete, a program of studies of not less than five full-year courses, or their equivalent.

(3) *Repeating students*

Repeating students will normally be required to complete a full academic program of five full courses or their equivalent in order to be considered for promotion. However, no student will be required to take more than the normal number of courses to complete his/her program.

(4) When a decision is made by the Revision's Committee to allow a Physical Therapy student to repeat a year, the Physical Therapy courses in which the student obtained a grade of 5 or less must be repeated.

(5) For students admitted after July 1st, 1978, advance credit in non-professional courses will only be granted in respect of courses completed less than 10 years prior to the date of admission.

(6) All students admitted or re-enrolled after July 1, 1977 will be required to complete PTHER 311 (Biomechanics in Physical Therapy) and P ED 302 (Physiology of Exercise), or their equivalent, before being recommended for the degree. Normally, the latter course will be taken as part of the elective requirement of the program.

(7) In order to meet patient protection standards suggested by Alberta Social Services and Community Health, and to protect the health of students, it is required that, prior to clinical experience (PTHER 411, 412, 413, 414) in the third year of the program, each student have (1) a medical examination, including a tuberculin skin test, and (2) primary or reinforcement immunization doses for diptheria, tetanus, poliomyelitis and rubella.

The physical examination and tuberculin test may be taken at the University Health Services, while immunizations should be obtained from a local health unit or a family physician. Certificates showing that these requirements have been met must be received by the Department of Physical Therapy before July 31. A detailed statement of this requirement is available at the Faculty of Rehabilitation Medicine Office.

First Year	*Total hours of instruction*
PTHER 200 (Histology)	26
PTHER 202 (Gross Anatomy I)	91
PTHER 204 (Gross Anatomy II)	91
PTHER 212 (Introduction to Physical Therapy)	72
PTHER 240 (Physical Therapy I)	78
PSYCO 260 (Basic Psychological Processes)	39
PSYCO 261 (Individual and Social Behavior)	39
PHYSL 261 (Physiology)	117
Approved elective	78
Second Year	
PTHER 311 (Biomechanics in Physical Therapy)	39
PTHER 312 (Introduction to Clinical Practice)	78
PTHER 316 (Neurosciences)	26
PTHER 321 (Electrotherapy I)	59
PTHER 322 (Electrotherapy II)	78
PTHER 332 (Clinical Sciences)	39
PTHER 341 (Physical Therapy II)	78
PTHER 343 (Physical Therapy III)	52
OCCTH 335 (Behavior in Illness)	39
OCCTH 445 (Clinical Neurophysiology)	39
P ED 302 (Physiology of Exercise)	65
Approved elective	39
Third Year	
PTHER 411 (Orthopaedics)	8 weeks
PTHER 412 (Neurology)	8 weeks
PTHER 413 (Thoracic conditions)	4 weeks
PTHER 414 (Rheumatic and Vascular)	4 weeks
PTHER 415 (Clinical Problems)	26 hours
PTHER 427 (Summer Internship)	12 weeks
Fourth Year	
PTHER 450 (Clinical Training)	216
PTHER 451 (Clinical Training)	216
PTHER 463 (Management of P.T.)	39
PTHER 469 (Research Methods)	39
PTHER 484 (Assessment and Treatment of Joints)	39
Plus any one(1) of the following:	
PTHER 465 (Issues in P.T.)	39
PTHER 467 (Individual Study)	39
PTHER 468 (Sports Therapy)	39
PTHER 471 (Geriatrics)	39
PTHER 472 (Paediatrics)	39
PTHER 478 (P.T. in Industry)	39
PTHER 480 (Respiratory)	39
PTHER 481 (Cardiac Rehabilitation)	52
Approved elective	78
Approved elective	78
Approved elective	39

One full elective or its equivalent must be at a senior level.

163.3 The Degree of B.Sc. in Speech Pathology and Audiology

To be admitted and allowed to continue in the Department of Speech Pathology and Audiology, a student normally will carry a minimum of five full courses (or the equivalent) each year. To graduate from the program a student must successfully complete the program of study in the recommended sequence. Under normal circumstances, enrollment in speech pathology and audiology courses (with the exception of SPA 280 and 281) will be restricted to students of the Department of Speech Pathology and Audiology.

Second Year	*Total hours of instruction*
PSYCO 375 (Brain and Behavior)*	39
SPA 379 (Articulation Disorders)	65
SPA 380 (Language Disorder in Children I)	65
SPA 381 (Anatomy and Physiology of the Speech and Hearing Mechanism)	130
SPA 382 (Applied Phonetics)	39
SPA 383 (Language Disorders in Children II)	65
SPA 384 (Clinical Procedures)	78
SPA 385 (Speech Science: Application of the Acoustic Aspects of Speech to Speech Pathology and Audiology	65
PSYCO 309 (Statistical Methods)	78
EDPSY 469 (Human Development)	39
or	
EDPSY 473 (Language and Cognition)	39
or	
PSYCO 353 (Developmental Psychology)	39
PSYCO 361 (Principles of Behavior Change)	78
or	
EDPSY 471 (Learning and Instruction)	39
Third Year	
SPA 389 (Cerebral Palsy and Communication Disorders)	52
SPA 390 (Aphasia)	52
SPA 392 (Audiology)	130
SPA 393 (Voice Disorders)	52
SPA 396 (Stuttering)	52
SPA 397 (Clinical Practice I: Communication Disorders)	39
SPA 399 (Clinical Practice II: Communication Disorders)	39
OCCTH 445 (Clinical Neurophysiology)	39
or	
PSYCO 477 (Human Neuropsychology)	39
SPA 480 (Clinical Internship)	6 weeks minimum
Any two approved half-year linguistics courses or their equivalent	78
Any one approved half-year elective	39
Fourth Year	
SPA 489 (Deafness)	65
SPA 490 (Current Research and Administration of Speech and Hearing Programs)	65
SPA 492 (Aural Rehabilitation)	65
SPA 493 (Introduction to Allied Rehabilitation Professions)	26

SPA 494 (Clinical Practice III: Communication Disorders)	65
SPA 495 (Clinical Practice IV: Communication Disorders)	65
Approved electives (2 full year courses or 4 half year courses.)	156

*Under consideration.

163.4 Teaching Diploma Program in Occupational Therapy

The Department of Occupational Therapy offers a two-year program leading to a Teaching Diploma in Occupational Therapy. The requirements for admission are set out in § 13.16.4 of the University Regulations and Information for Students Calendar. The requirements for promotion and graduation are the same as for the undergraduate programs offered by the Faculty. Assistantships are available to well-qualified candidates.

First Year	*Total hours of instruction*
OCCTH 515 (Occupational Therapy seminars)	156
OCCTH 516 (Occupational Therapy seminars)	156
OCCTH 517 (Occupational Therapy Practice Teaching)	156
EDFDN 201 (Introduction to Education)	39
EDIND 385 (Evaluation Methods)	39
EDIND 497 (Curriculum Development)	91
Second Year	
OCCTH 525 (Occupational Therapy seminars)	156
OCCTH 526 (Thesis Preparation)	156
OCCTH 527 (Occupational Therapy Practice Teaching)	156
EDPSY 471 (Learning and Instruction)	39
and	
EDPSY 469 (Human Development & Education)	39
or	
EDPSY 475 (Individual Differences in Education)	
or	
EDPSY 487 (Principles of Classroom Measurement)	
or	
EDPSY 489 (Test Construction for Teachers)	

163.5 The Degree of Master of Science in Physical Therapy

(1) *Purpose of the Program:* To prepare physical therapists for leadership roles in academic, clinical, and laboratory settings by preparing them to undertake research to establish the effectiveness of various approaches to treatments used by physical therapists and by so doing, develop a strong scientific framework for the discipline of physical therapy.

The program has been designed in response to increased demands by academic and clinical institutions for therapists educated above the present baccalaureate level. It provides persons holding a baccalaureate degree in physical therapy with an opportunity for advanced study in their own field. The program at The University of Alberta offers advanced training in orthopaedics, sports therapy, therapeutic exercise and other Physical Therapy specialty areas.

(2) *Format of the Program.* The proposed program normally takes two years, but the time may vary according to the academic background of each student. The Faculty of Graduate Studies and Research requires that a minimum of one academic year (8 months) must be spent in residence for a Master of Science Degree. Thus, it may be possible to complete the program in less than two years, depending on the student's academic background.

During the first year of the program students are expected to select a pattern of courses in a particular area of interest which will enable them to bring their previous educational background in physical therapy and associated fields to an advanced level, to enable them later to engage in meaningful research within that area.

In order that students may design a program which fits their particular needs, the Department of Physical Therapy requires only one compulsory course — PTHER 500: Research Seminar.

At least six months prior to the oral defense of their thesis, students are required to pass a general competency examination in physical therapy. Normally, the examination takes place between the first and second year of the program. The examination, which may be oral or written, is under the direction of the Chairman of the Department of Physical Therapy or his designee, and the examination committee consists of members of the physical therapy teaching staff.

During the second year of the program, the student focuses on the development of research skills through appropriate course work in research methodology, directed study and activity with an in-depth exploration of his/her particular area of interest under faculty guidance.

Normally, the course requirements for the degree of Master of Science in Physical Therapy is four to six full courses, or their equivalent, at graduate level, in addition to the thesis. Students, in consultation with their advisor, will design a program of studies suitable to their particular needs and interests with course requirements being based on students' previous training and anticipated needs in their area of interest. Courses from other departments may be accepted as part of a student's total program. Some undergraduate course work may be contained in a student's program, providing that a minimum of four full graduate courses, or their equivalent, are also included. Credit for courses taken elsewhere may be granted Advanced Credit by the Dean of Graduate Studies and Research upon recommendation of the Department of Physical Therapy provided that the courses have not been counted towards a previous degree or program.

Each student will be required to complete a thesis based on independent investigation. The thesis will carry a weighting equivalent to at least 2 full graduate courses.

164.1 General Information

In the Faculty of Rehabilitation Medicine, all courses are restricted to students within the Department concerned, with the exception of those designated as follows:

(a) * open to all students

(b) ** open to other students with permission of the instructor.

Courses required of students in the Faculty of Rehabilitation Medicine are listed here.

Each course is designated by its computer abbreviation and by a number. Students should use this abbreviation and number when filling in their registration forms.

The course title is followed by the symbol "★" and a number indicating the course weighting used in computing the grade-point average. Usually a single-term course carries a weight of 3, a full-session course a weight of 6. The statement in parentheses refers to the number of hours required by the course each week. For single-term courses the term in which the course is offered is listed first. For full-session courses the time allotment is the same in both terms unless otherwise indicated. The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. Courses not included in the computation of grade-point averages are marked "Credit".

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

164.2 Occupational Therapy

OCCTH 201. *Introductory Anatomy.* ★6 (4-0-2) Lectures and demonstrations giving a systematic study of gross and functional anatomy of the human body.

*OCCTH 207. *History, Systems and Resources of Rehabilitation.* ★3 (either term, 3-0-0). Development and organization of major services for the handicapped. Legal, educational and governmental influences on these services. The role of the O.T. in the overall system; models of O.T. service.

*OCCTH 208. *Introduction to Occupational Therapy Theory and Practice in Psychiatry.* ★3 (either term, 3-0-0). Basic theory of program development; implementation and evaluation in psychiatric O.T. services. Introduction to clinical disorders in psychiatry. Use of communication techniques and interpersonal skills. Presentation of case studies to illustrate principles.

OCCTH 209. *Therapeutic Occupation.* ★3 (either term, 0-0-6). Practical experience in a variety of manual skills suitable for use as therapeutic media in an occupational therapy program.

OCCTH 211. *Introduction to Occupational Therapy Theory and Practice in Physical Medicine.* ★3 (either term, 2-0-4). Basic theory of program development; implementation and evaluation in physical medicine O.T. services: Practical classes in patient evaluation; handling techniques and application of treatment media.

OCCTH 304. *Occupational Therapy Theory and Practice in Psychiatry.* ★3 (either term, 2-0-1). Designed to link previous study of behavior and the theoretical aspects of occupational theory with the requirements of clinical practice in the area of psychosocial dysfunction.

OCCTH 316. *Neuroanatomy.* ★3 (either term, 2-0-1). A detailed study of the nervous system.

OCCTH 319. *Life Span Development.* ★3 (either term, 2-0-1). The study of the development of the child to maturity, the changing periods of adulthood and the significance of the aging process. Study will include both physical and psychosocial factors as they relate to occupational therapy.

OCCTH 328. *Fieldwork.* ★0 (8 weeks) Credit. A period of 8 weeks in approved hospitals and institutions for practical experience within occupational therapy departments.

OCCTH 333. *Medicine and Surgery.* ★3 (Second Term, 3-1s-0). A series of lectures on common diseases and conditions encountered in the practice of occupational therapy, including pathology, medical and surgical conditions, and their treatment.

OCCTH 334. *Orthopedics.* ★3 (Second Term, 2-0-2). Lectures and demonstrations pertaining to the etiology, management and treatment of patients suffering from orthopedic disorders.

OCCTH 335. *Human Behavior in Illness and Disability.* ★3 (either term, 3-0-0). An orientation towards the understanding of personality, its development and function in health and disease. An introduction to group dynamics. Open to other students with the consent of the department.

OCCTH 340. *Behavior Management in Occupational Therapy.* ★3 (either term, 2-0-1). An introduction to the implementation of behavior management practices within occupational therapy. Emphasis will be on the design and application of programs in behavior modification as they relate to particular clinical settings.

OCCTH 401. *Perceptual Motor Development.* ★3 (either term, 2-0-1). The study of perceptual motor development, assessment and remediation. Primary area of concern — children. A lecture and laboratory course designed to provide students with a working knowledge of assessment and intervention programs in the treatment of perceptual motor dysfunction.

**OCCTH 402. *Self Development and Communication.* ★3 (either term, 0-4s-0). A seminar/laboratory course designed to provide students with an opportunity to experience various facilitating activities used in conjunction with therapy and the development of self.

OCCTH 403. *Occupational Therapy, Theory and Practice in Neurology.* ★3 (either term, 2-0-1). Occupational Therapy principles, patient evaluation, and treatment procedures in a variety of neurological conditions.

OCCTH 404. *Occupational Therapy, Advanced Therapeutic Approach to Psychosocial Dysfunction.* ★3 (either term, 0-3s-0). Basic principles of leadership, group development and some approaches to psychotherapy as applied to occupational therapy.

OCCTH 405. *Research Theory in O.T.* ★3 (either term, 3-0-0). Lectures and discussion on the theory of research design procedures and their application to occupational therapy. Prerequisite: An approved introductory statistics course or consent of the department.

OCCTH 406. *Applied Research Design in O.T.* ★3 (either term, 0-3s-0). Seminar presentation which directly applies research design to ongoing research in occupational therapy. Students will design a clinical research project and present the proposal in class. Prerequisite: OCCTH 405 or consent of the department, an approved introductory statistics course.

OCCTH 415. *Pre-vocational Assessment and Heavy Work.* ★3 (either term, 1-0-2). A lecture/lab course designed to introduce students to the basic principles of pre-vocational evaluation and training with particular emphasis on activities that can be used for heavy work experiences.

OCCTH 427. *Fieldwork.* ★0 (Second Term, 0-0-15). Credit. The continuation of fieldwork under the supervision of qualified occupational therapists.

OCCTH 428. *Fieldwork.* Credit. 8 week period in approved institutions or hospitals for practical experience in occupational therapy departments.

OCCTH 429. *Fieldwork.* (First Term, 0-0-34). Credit. Practical application of occupational therapy techniques under the supervision of occupational therapy staff in approved facilities.

OCCTH 435. *Advanced Psychiatry.* ★3 (either term, 0-3s-0). A discussion of factors influencing personality function — factors both detrimental and beneficial. Personality disorders, their diagnosis, classification and treatment, with special reference to the role of the occupational therapist.

OCCTH 436. *Mental Retardation and Child Dysfunction.* ★3 (either term, 2-0-1). The study of abnormal, psychological, emotional, physical, social, and intellectual development of the child from birth through adolescence. The theoretical and applied aspects of the child's abnormal physical-psychosocial development will be considered with special emphasis on occupational therapy as it applies to the assessment, program planning and home management.

OCCTH 437. *Occupational Therapy in Geriatrics.* ★3 (either term, 2-0-1). The study of the special needs of the geriatric client and the application of O.T. techniques. Topics will include the O.T. role in health problems of the elderly, psychosocial implications of retirement, housing and family issues.

OCCTH 445. *Clinical Neuro-Physiology.* ★3 (Second Term, 3-0-0). An introduction and appreciation of the neuro-physiology and gross pathology of some of the common disease conditions referred to Rehabilitation Departments for treatment.

OCCTH 455. *Seminar — Administrative Issues in Rehabilitation.* ★3 (either term, 0-3s-0). Senior seminar presented by a variety of health care professionals and University staff concerning the planning, development, organization, and administration of occupational therapy services within the Canadian Health Care system.

OCCTH 456. *Clinical Seminar.* ★3 (either term, 0-3s-0). Senior seminar presented by clinicians and University staff. Current developments and research in psychosocial and physical dysfunction.

OCCTH 498. *Special Seminars.* ★3 (either term, 0-3s-0). Content varies from year to year. Topics will be announced prior to registration period. Prerequisite: Consent of the department.

OCCTH 499. *Individual Study.* ★3 (either term, 0-3s-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. This may take the form of directed reading, laboratory or clinical experience. Prerequisite: Departmental consent.

OCCTH 515. *Occupational Therapy Seminars.* ★6 (4-2s-0). Seminars on teaching methods and the preparation of a minimum of two activities to an advanced level in the laboratory.

OCCTH 516. *Occupational Therapy Seminars.* ★4 (4-2s-0). Seminars in the administration of educational programs in O.T., fieldwork supervision and development. Student selection, syllabus and timetable development.

OCCTH 517. *Occupational Therapy Practice Teaching.* ★4 (0-0-6). Supervised practice teaching and methodology. Communication theory and the use of audio and visual aids in the classroom.

OCCTH 525. *Occupational Therapy Seminars.* ★3 (4-2s-0). A continuation of OCCTH 515. Detailed preparation of teaching plans for full academic courses. Formulating lesson plans. Programmed learning.

OCCTH 526. *Thesis Preparation.* ★6 (0-0-6). A continuation of OCCTH 516. The preparation and presentation of a minor thesis.

OCCTH 527. *Occupational Therapy — Practice Teaching.* ★4 (0-0-6). A continuation of OCCTH 517. Testing and examination problem areas. Counselling and interviewing.

164.3 Physical Therapy

PTHER 200. *Histology.* ★3 (First Term, 2-0-0). An introduction to the structure and function of body tissues.

PTHER 202. *Gross Anatomy I.* ★3 (First Term, 3-0-4). Lectures and dissections on the upper limb, supplemented by classes in functional anatomy of this area.

PTHER 204. *Gross Anatomy II.* ★3 (Second Term, 3-0-4). Lectures and dissections on the lower limb and trunk supplemented by classes in functional anatomy of this area.

PTHER 212. *Introduction to Physical Therapy.* ★3 (First Term, 1½-0-4). An introductory course dealing with the underlying principles on which the practice of physical therapy is based.

PTHER 240. *Physical Therapy I.* ★3 (Second Term, 3-0-3). Theory and practice of movement, massage, muscle testing and strengthening.

PTHER 310. *Scientific Basis of Athletic Injuries.* ★3 (either term, 2-0-1). An introduction to orthopaedics and related topics which may be encountered by athletic therapists and physical educators (for Physical Education students in the Sports Science route only). Prerequisite: P ED 204 (Structural Anatomy), P ED 206 (Functional Anatomy) and P ED 290 (Scientific Basis of Athletic Conditioning).

PTHER 311. *Biomechanics in Physical Therapy.* ★3 (either term, 3-0-0). Biomechanical principles and techniques with some applications to physical therapy.

PTHER 312. *Introduction to Clinical Practice.* ★3 (Second Term, 3-0-3). The principles of patient assessment and planning of treatment programs. Visits to selected institutions.

PTHER 316. *Neurosciences.* ★3 (First Term, 2-0-0). A study of the anatomy of the head, vertebrae column, and central nervous system.

PTHER 321. *Electrotherapy I.* ★3 (First Term, 3-0-1½). The production and application of low frequency currents.

PTHER 322. *Electrotherapy II.* ★3 (Second Term, 3-0-3). The production and application of high frequency currents and radiations.

PTHER 332. *Introduction to Clinical Sciences.* ★3 (either term, 3-0-0). A lecture series on normal human development and mechanisms of disease.

PTHER 341. *Physical Therapy II.* ★3 (First Term, 3-0-3). Theory and practice of facilitation techniques of therapeutic exercise, and methods for improvement of respiratory function.

PTHER 343. *Physical Therapy III.* ★3 (Second Term, 1-0-3). Theory and practice of selected mobilizing techniques used in Physical Therapy.

PTHER 411. *Orthopaedics.* ★10 (0-5s, 15c-6, 8 weeks). An introduction to the study of orthopaedic conditions encountered by the physical therapist and methods of treatment of selected orthopaedic problems.

PTHER 412. *Neurology.* ★10 (0-5s, 15c-6, 8 weeks). An introduction to the common problems associated with neurological conditions encountered by the physical therapist, and a survey of the approaches to treatment of selected neurological conditions.

PTHER 413. *Thoracic Conditions.* ★5 (0-5s, 15c-6, 4 weeks). A consideration of the role of the physical therapist in the treatment of diseases affecting the heart, lungs, and bronchial tree.

PTHER 414. *Rheumatic and Vascular Disorders.* ★5 (0-5s, 15c-6, 4 weeks). A study of collagen diseases, peripheral vascular disorders and their associated problems, including the role of the physical therapist in their management.

PTHER 415. *Selected Clinical Problems.* ★2 (1-0-1½; 1-0-0). A series of lectures and clinical visits.

PTHER 427. *Summer Internship.* ★0 (12 weeks) Credit. During the summer, following completion of the third year, students will spend twelve weeks as interns in approved Physical Therapy Departments.

PTHER 450. *Clinical Training.* ★3 (either term, 0-18c-0). A continuation of practical experience.

PTHER 451. *Clinical Training.* ★3 (either term, 0-18c-0). A continuation of practical experience.

PTHER 463. *Management of Physical Therapy Services.* ★3 (either term, 3-0-0). Problems involved in the planning development, organization, and administration of physical therapy services.

PTHER 465. *Issues in Physical Therapy.* ★3 (either term, 0-3s-0). Selected legal, political and social issues related to the practice of Physical Therapy.

**PTHER 467. *Individual Study.* ★3 (either term, 3-0-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. This may take the form of directed reading, laboratory work or clinical experience. Prerequisite: Consent of the Department.

**PTHER 468. *Sports Therapy.* ★3 (either term, 2-0-1). An introduction to the prevention and care of sports injuries including the adaption of therapeutic exercise to the highly trained individual.

PTHER 469. *Research Methods in Physical Therapy.* ★3 (either term, 3-0-0). The principles of scientific method, and their application to physical therapy in laboratory and clinical settings.

PTHER 471. *Geriatrics and the Physical Therapist.* ★3 (either term, 2-0-1). Physical Therapy applied to the care of the geriatric patient in the home and in institutions.

PTHER 472. *Paediatrics and the Physical Therapist.* ★3 (either term, 2-0-1). Physical Therapy applied to the care of the paediatric patient in the home and in the institution.

PTHER 478. *Physical Therapy in Industry.* ★3 (either term, 2-0-1). The provision of preventive and treatment services in industrial settings by physical therapists.

PTHER 480. *Respiratory Conditions.* ★3 (either term, 2-0-1). An advanced course in the pathophysiology, assessment and treatment of patients with respiratory conditions.

**PTHER 481. *Cardiac Rehabilitation.* ★3 (either term, 2-0-2). The physiological and psychological aspects of rehabilitation of the cardiac patients, with practical experience in their management. Prerequisite: P ED 302 or equivalent.

PTHER 484. *Assessment and Treatment of Joints.* ★3 (either term, 2-0-1). The assessment and treatment by manual techniques of peripheral and vertebral joints. Not open to students with credit for PTHER 461, PTHER 482, or PTHER 483.

164.3.2. GRADUATE COURSES

PTHER 500. *Research Seminar.* ★3 (either term, 0-3s-0). The examination, evaluation and preparation of the research proposal and research report. Student will discuss critically various aspects including: the selection of the problem, the review of the literature, the research hypothesis, the collection and analysis of the data, and the significance of the research.

PTHER 502. *Peripheral Articular Anatomy.* ★3 (either term, 1-1-2). Detailed functional and pathological anatomy of the peripheral joints of the body. Particular reference is given to the clinical relevance of the topics discussed.

PTHER 504. *Vertebral Articular Anatomy.* ★3 (either term, 1-1-2). Detailed functional and pathological anatomy of the vertebral joints of the body. Particular reference is given to the clinical relevance of the topics discussed.

PTHER 505. *Advanced Techniques of Movement Analysis.* ★3 (either term, 2-0-2). The principles, theory and application of advanced methods of movement analysis as related to physical therapy.

PTHER 506. *Electromyographic Kinesiology.* ★3 (either term, 2-0-2). Seminar and laboratory sessions on advances in electromyography applied to physical therapy and allied areas.

PTHER 507. *Instrumentation in Physical Therapy.* ★3 (either term, 2-0-2). A course on electronic fundamentals applied to measuring instruments and their basic components as used in physical therapy research.

PTHER 508. *Clinical Investigation Methods.* ★3 (either term, 2-0-2). Theory, analysis and application of advanced techniques used in physical therapy assessment and clinical research.

PTHER 509. *Tissue Biomechanics.* ★3 (either term, 2-0-2). A consideration of the mechanical properties of biological tissue in normal and selected pathological situations.

PTHER 510. *Rehabilitation Ergonomics.* ★3 (either term, 2-0-2). The application of ergonomic principles in rehabilitation.

PTHER 530. *Research and Directed Studies.* ★3 (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 531. *Research and Directed Studies.* ★3 (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 532. *Research and Directed Studies.* ★3 (1.5-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 533. *Research and Directed Studies.* ★6 (3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 540. *Practicum.* (Credit). A practicum in the student's area of concentration and interest to be taken by the student if his/her committee feels the student needs, or the student desires, further practical experience. This course may involve experience off campus in any geographical area where the student may gain the necessary experience.

PTHER 561. *Pathokinesiology of Peripheral Joints.* ★3 (either term, 1-0-2). The application of kinesiological analysis to the treatment of pathological conditions affecting the peripheral joints.

PTHER 562. *Pathokinesiology of the Spinal Joints.* ★3 (either term, 1-0-2). The principles, theory and application of advanced techniques of mobilization on selected spinal joint syndromes.

PTHER 568. *Advanced Sports Therapy.* ★3 (either term, 0-3s-0). Seminar on advances in sports therapy and other related topics.

PTHER 570. *Measurement and Evaluation in Physical Therapy.* ★3 (either term, 2-0-3). The principles involved in measurement and evaluation and their application in the practice of physical therapy.

PTHER 571. *Advanced Geriatric Rehabilitation.* ★3 (either term, 0-3s-0). Seminar on methods of assessment of physical programs of the elderly and the management of programs for care in various settings for the long term support of elderly patients.

PTHER 573. *Prosthetics and the Amputee.* ★3 (either term, 2-0-1). Management and rehabilitation problems arising from the design and use of prosthetics.

PTHER 575. *Advanced Therapeutic Exercises.* ★3 (either term, 2-0-1). Physiological and therapeutic principles in the evaluation and comparative analyses of various approaches to exercise.

PTHER 580. *Curriculum Analysis in Physical Therapy.* ★3 (either term, 0-3s-0). Analysis of curriculum and its relevance to the process of physical therapy undergraduate, graduate and continuing education.

PTHER 581. *Information Transfer in Physical Therapy Education.* ★3 (either term, 1-0-2). Application of the principles of information transfer to physical therapy undergraduate, graduate and continuing education.

164.4 Speech Pathology and Audiology

*SPA 280. *Introduction to Normal Human Communication.* ★3 (Second Term, 3-0-1). Introduction to the development of normal speech language and a survey of classical and contemporary principles and processes in verbal communications.

*SPA 281. *Survey of Speech Pathology and Audiology.* ★3 (First Term, 3-0-1). An introduction to the disorders of human communication and the roles of the speech pathologist and audiologist.

SPA 379. *Articulation Disorders.* ★4 (First Term, 3-0-2). A study of the etiology and behavioral characteristics associated with articulation disorders. Special emphasis will be given to evaluative and rehabilitative procedures utilized in articulation modification. Corequisite: SPA 382.

SPA 380. *Language Disorders in Children I.* ★4 (First Term, 3-0-2). A study of the etiology and behavioral characteristics associated with language disorders of children. Emphasis will be given to evaluative and rehabilitative procedures utilized in language training and modification.

SPA 381. *Anatomy and Physiology of the Speech and Hearing Mechanism.* ★3 (First Term, 3-0-2). Lectures and demonstrations, providing a systematic study of the anatomy and physiology of the speech support mechanism. The area of embryology will also be covered. Laboratory facilities will be available for observation and dissection of speech support mechanism.

SPA 382. *Applied Phonetics.* ★3 (either term, 2-0-1). Training, recognition and production of sounds of spoken English, analysis of information, introduction to the method of investigation, and classification of speech sounds.

SPA 383. *Language Disorders in Children II.* ★4 (Second Term, 3-0-2). Advanced theoretical and applied considerations in language assessment and modification. Emphasis will be placed on the design and analysis of individualized programs of language remediation. Prerequisite: SPA 380.

SPA 384. *Clinical Procedures.* ★6 (2-0-1). Basic principles underlying evaluative and therapeutic procedures in communi-

cation disorders. Includes laboratory and clinical experience in observation, recording and analysis of data relevant to the clinical process.

SPA 385. *Speech Science: Application of the Acoustic Aspects of Speech to Speech Pathology and Audiology.* ★3 (Second Term, 3-0-1). A study of the acoustic fundamentals and approaches to electroacoustic measurements and auditory perceptual characteristics of speech signals. Concepts, theories, and terminologies introduced in the course will be related to clinical applications in Speech Pathology and Audiology. Students will be expected to complete a research project to replicate historical or contemporary research on acoustic or auditory perceptual aspects of speech signals. Prerequisites: SPA 380, 381, 382.

SPA 389. *Cerebral Palsy and Communication Disorders.* ★4 (First Term, 3-0-1). A study of the etiologies and characteristics of cerebral palsy with emphasis on the management of related communication disorders. Prerequisites: SPA 379 and 383. OCCTH 316 or PSYCO 475 recommended.

SPA 390. *Aphasia and Associated Disorders.* ★4 (Second Term, 3-0-1). A discussion of the etiologies, diagnostic and rehabilitation procedures associated with the communication disorders of the neurologically impaired. Prerequisites: SPA 379 and 383 and OCCTH 316 or PSYCO 475.

SPA 392. *Audiology.* ★8 (3-0-2). An introduction to audiology including administration of hearing tests, case findings, interpretation of test results, etc. Pre- or corequisite: SPA 381.

SPA 393. *Voice Disorders.* ★4 (First Term, 3-0-1). The etiologies and characteristics associated with voice disorders; the diagnostic and therapeutic procedures used in rehabilitation. Prerequisite: SPA 381.

SPA 396. *Stuttering.* ★4 (either term, 3-0-1). A study of etiological theories, diagnostic and therapeutic procedures used with stutterers.

SPA 397. *Clinical Practice I: Communication Disorders.* ★0 (First Term, 1-0-2). Credit. Practical application of clinical procedures under direct supervision for a minimum of two hours per week. Prerequisite: SPA 379, 383, and 384.

SPA 399. *Clinical Practice II: Communication Disorders.* ★0 (Second Term, 1-0-2). Credit. Practical application of clinical procedures under direct supervision for a minimum of two hours per week. Prerequisites: SPA 379, 383 and 384.

SPA 480. *Clinical Internship.* ★0 (six weeks). Credit. During spring and/or summer following the third year, students will spend a minimum of six weeks in full-time clinical practice under direct supervision in an approved institution. Prerequisites: SPA 397 and 399.

SPA 482-488. *Special Topics in Speech Pathology.* ★3 (either term, 0-3s-0). Optional seminars offered providing sufficient response is shown by a number of students. Prerequisite: Department consent.

SPA 489. *Deafness.* ★4 (Second Term, 3-0-2). Characteristics of the deaf population with an emphasis on rehabilitative needs. An introduction to oral, aural and manual methods of communication for the deaf. Prerequisites: SPA 379, 383, and 392.

SPA 490. *Current Research and Administration of Speech and Hearing Programs.* ★3 (1.5-0-0). A series of seminars covering recent research in speech pathology and audiology and the administration and organization of speech and hearing programs. Prerequisite: PSYCO 309.

SPA 492. *Aural Rehabilitation.* ★4 (First Term, 3-0-2). Intensive preparation and study in depth of the problems of working with the hard of hearing, including speech reading techniques, auditory training and counselling. Prerequisites: SPA 379, 383, and 392.

SPA 493. *Introduction to Allied Rehabilitation Professions.* ★0 (either term, 1.5-0-0). Credit. A discussion and demonstration of the role of allied professionals by representatives from medicine, O.T., P.T., psychology, education, social work, etc.

SPA 494. *Clinical Practice III: Communication Disorders.* ★0 (single term, 1-0-4). Credit. Advanced clinical procedures. Minimum four hours per week. Prerequisite: SPA 480 or Department consent.

SPA 495. *Clinical Practice IV: Communication Disorders.* ★0 (single term, 1-0-4). Credit. Advanced clinical procedures. Minimum four hours per week. Prerequisite: SPA 480 or Department consent.

SPA 499. *Individual Study.* ★3 (either term, 3-0-0). A course intended to allow the senior undergraduate student to pursue a topic of interest in more depth than the classroom structure permits. This may take the form of directed reading, laboratory or clinical experience. Prerequisite: Department consent.

164.5 Educational Foundations

EDFDN 201. *Introduction to Canadian Education.* ★3 (either term, 3-0-0). A study of the philosophical, political, social, economic and religious influences that have shaped educational theory and practice in Canada.

164.6 Educational Psychology

EDPSY 469. *Human Development and Education.* ★3 (either term, 3-0-0). Human developmental theories stressing physical, mental, social, emotional and personality development.

EDPSY 471. *Learning and Instruction.* ★3 (either term, 3-0-0). A variety of learning theories and concepts, and their implications for teaching.

EDPSY 473. *Language and Cognition in the Education of the Child.* ★3 (either term, 3-0-0).

EDPSY 475. *Individual Differences in Education.* ★3 (either term, 3-0-0). Individual differences of behavior, emotional and social adjustment towards educational processes.

EDPSY 487. *Principles of Classroom Measurement.* ★3 (either term, 3-0-0).Prerequisites: EDPSY 269 and 271 or consent of the Department.

EDPSY 489. *Test Construction for Teachers.* ★3 (either term, 3-0-0). The construction of standardized and other tests. Recording, interpreting and reporting results.

164.7 Education—Industrial and Vocational

Department of Industrial and Vocational Education

EDIND 385. *Methods of Performance Evaluation in Vocational Education.* ★3 (either term, 3-0-0).

EDIND 497. *Curriculum Development.* ★3 (either term, 2-1s-4). Development of curricula for industrial and vocational subjects.

164.8 Physical Education

P ED 302. *Physiology of Exercise.* ★3 (either term, 3-0-2). An introduction to physiological adaptations to stress of exercise and training. Prerequisite: PHYSL 260 or equivalent or consent of the Department.

164.9 Physiology

PHYSL 261. *Elementary Physiology.* ★6 (3-0-0; 3-0-3). Available only to students in the Faculty of Rehabilitation Medicine, the Medical Laboratory Science program in the Faculty of Medicine, and the Faculty of Nursing.

PHYSL 262. *Elementary Physiology.* ★6 (3-0-0). Available only to students in the Faculty of Rehabilitation Medicine and the Faculty of Nursing.

164.10 Psychology

PSYCO 260. *Basic Psychological Processes.* ★3 (either term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 261. *Individual and Social Behavior.* ★3 (either term, 3-0-0). Introduction to the study of human individuality, personality, and some social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be included. Prerequisite: PSYCO 260.

PSYCO 309. *Statistical Methods.* ★3 (either term, 3-0-1). Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of sampling theory and tests of statistical hypotheses. Prerequisite: Mathematics 30, MATH 100, or consent of the Department.

PSYCO 341. *Social Psychology.* ★3 (either term, 3-0-0). Individual and group behavior observed in social processes. Prerequisite: PSYCO 260/261 (or equivalent). Note: PSYCO 341 and SOC 341 may not both be taken for credit.

PSYCO 353. *Developmental Psychology.* ★3 (either term, 3-0-0).

PSYCO 361. *Principles of Behavior Change.* ★3 (First Term, 3-0-0). An introduction to behavior change techniques. The course will examine the origin of such techniques in animal experimentation and learning theory, and an evaluation of their effectiveness when applied to specific problem populations. Prerequisite: PSYCO 260. Note: Students cannot receive credit for both PSYCO 365 and 361.

PSYCO 375. *Brain and Behavior.* ★3 (either term, 3-0-0). Introduction to brain function related to sensation, movement, learning, motivation, and thinking. Prerequisite: PSYCO 260.

PSYCO 477. *Human Neuropsychology.* ★3 (Second Term, 3-0-0). Changes in mood, motivation, perception, attention, memory and language as revealed by experimental research on normal, mentally retarded, mentally ill and brain damaged individuals. Prerequisite: PSYCO 260.

164.11 Sociology

SOC 202. *Introductory Sociology.* ★6 (3-0-0). An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government). The processes whereby the individual is socialized into society; the sources of conformist and non-conformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 403. *Principles of Sociology.* ★3 (either term, 3-0-0). Basic concepts and principles of Sociology for students with advanced standing. Prerequisite: Senior or graduate standing. Note: May not be taken for credit by students with credit in SOC 202.

Faculté Saint-Jean

171 INTRODUCTION

171.1 Personnel académique de la Faculté

171.1.1 PERSONNEL

Professeur et Doyen
G. MORCOS, Dipl. E.N.S. de Saint-Cloud D.U. Paris

Professeur
F. J. McMAHON, B.A., M.Th.

Professeurs Agrégés
T. BILODEAU, Lic. Ph. (Philosophie)
E. V. BLACKBURN, Ph.D. (Chimie)
G. CADRIN, D.U. (Francais)
S. T. CAREY, Ph.D. (Psychologie)
D. DESMARAIS, M.Sc. (Mathématiques)
J. FORTIER, M.A. (Lettres Classiques)
L. GODBOUT, L.Ph. (Philosophie)
H. HEBERT, M.E.P. (Education physique)
M. KAPETANOVICH, D.U. (Francais)
R. A. PITTS, Ph.D. (Sociologie)
S. SHERIDAN, Ph.D. (Biologie)

Professeurs Adjoints
G. ALLAIRE, M.A. (Histoire)
E. A. AUNGER, Ph.D. (Science Politique / Economie)
J. COLSON, Doct. (Linguistique)
G. GUENETTE, M.A., (Francais)
A. LAFRANCE, B.A., B.Ed., M.Mus. (Musique)
F. LEVASSEUR-OUIMET, M.A. (Francais)
L. MacCALLUM, M.A. (Anglais)

Faculty Service Officer
S. LANDRY, (B.Ed.)

Bibliothécaire
G. E. DUROCHER, M.Lib.

171.1.2 AUTRES MEMBRES DU CONSEIL ACADEMIQUE DE LA FACULTÉ

Président de l'Université
M. HOROWITZ, Ed. D.

Représentant de la Faculté des Lettres
K. KROTKI, Ph.D., S.R.C.
(J.R. WILSON, Ph.D. substitut)

Représentant de la Faculté d'Éducation
D. V. PARKER, Ph.D.

Représentant de la Faculté des Sciences
A. STEINER, D es Sc (Paris)

Représentant du Département des Langues Romanes
N. BONVALET, Doct. T.C.

Représentant de l'A.C.F.A.
Secteur Education

Représentant de A.T.A. (Alberta Teachers' Association)

Représentant de l'Ecole J.H. Picard

171 INTRODUCTORY

171.1 Members of the Faculté

171.1.1 STAFF

Professor and Dean
G. MORCOS, Dipl. E.N.S. de Saint-Cloud, D.U. Paris

Professor
F. J. McMahon, B.A., M.Th.

Associate Professors
T. BILODEAU, Lic. Ph. (Philosophy)
E. V. BLACKBURN, Ph.D. (Chemistry)
G. CADRIN, D.U. (French)
S. T. CAREY, Ph.D. (Psychology)
D. DESMARAIS, M.Sc. (Mathematics)
J. FORTIER, M.A. (Classics)
L. GODBOUT, L.Ph. (Philosophy)
H. HEBERT, M.P.E. (Physical Education)
M. KAPETANOVICH, D.U. (French)
R. A. PITTS, Ph.D. (Sociology)
S. SHERIDAN, Ph.D. (Biology)

Assistant Professors
G. ALLAIRE, M.A. (History)
E. A. AUNGER, Ph.D. (Political Science / Economics)
J. COLSON, Ph.D. (Linguistics)
G. GUENETTE, M.A. (French)
A. LAFRANCE, B.A., B.Ed., M.Mus. (Music)
F. LEVASSEUR-OUIMET, B.Ed., M.A. (French)
L. MacCALLUM, M.A. (English)

Faculty Service Officer
S. LANDRY, B.Ed.

Librarian
G. E. DUROCHER, M.Lib.

171.1.2 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President of the University
M. HOROWITZ, Ed.D.

Representative, Faculty of Arts
K. KROTKI, Ph.D., F.R.S.C.
(J. R. WILSON, Ph.D., alternate)

Representative, Faculty of Education
D. V. PARKER, Ph.D.

Representative, Faculty of Science
A. STEINER, D es Sc (Paris)

Representative, Department of Romance Languages
N. BONVALET, Doct. T.C.

Representative, A.C.F.A.
Education Field

Representative, A.T.A.

Representative, J.H. Picard School

Représentants (5) de l'A.U.F.S.J.
(Association des Universitaires du F.S.J.)

Registraire de l'Université
W. A. BLANCHARD, Ph.D.

Representatives (5), A.U.F.S.J.
(Students' Union at Faculté)

Registrar of the University
W. A. Blanchard, Ph.D.

171.2 Renseignements Généraux

171.2.1 NOTE HISTORIQUE ET BUTS

Le Collège Saint-Jean a été fondé en 1908, l'année même où a été inaugurée la Faculté des Arts et des Sciences de l'Université de l'Alberta.

Les deux institutions ont le même âge mais ont évolué de façon très différente. Le Collège est devenu Collège Universitaire Saint-Jean, partie intégrante et secteur bilingue de l'Université de l'Alberta, 62 ans après sa fondation, le 27 novembre 1970. Le statut officiel de Faculté lui fut accordé en septembre 1977 et sa dénomination devient "Faculté Saint-Jean" en mai 1978.

La Faculté Saint-Jean, faculté bilingue de l'Université de l'Alberta, doit d'abord permettre aux étudiants francophones de poursuivre leurs études universitaires dans un milieu qui leur assure une culture et un progrès intellectuel d'inspiration française et ensuite permettre aux étudiants anglophones de bénéficier de ce milieu.

L'Université espère promouvoir ainsi la culture française en Alberta et permettre à un plus grand nombre d'étudiants de s'exprimer couramment dans les deux langues officielles du Canada.

La Faculté Saint-Jean se trouve à environ 6 kilomètres à l'est du campus ouest. Les étudiants peuvent cependant suivre des cours à la fois à la Faculté Saint-Jean et dans d'autres facultés de l'Université grâce à un service de minibus gratuit entre les deux campus (toutes les heures).

171.2.2 SERVICES

(1) *Bibliothèque*

La Faculté met à la disposition de ses professeurs et de ses étudiants une riche bibliothèque, contenant des oeuvres dans les deux langues. C'est une bibliothèque de consultation et de prêt. Tous les étudiants ont également accès aux bibliothèques de l'Université de l'Alberta.

(2) *Centre de Documentation Pédagogique*

Pour les étudiants et professeurs en pédagogie, la Faculté offre également un service de prêt et de consultation par l'entremise du Centre de Documentation Pédagogique (matériel en français uniquement).

(3) *Service d'Orientation*

La Faculté met à la disposition des étudiants un Service d'Orientation spécialisé. Le service offre à tous les étudiants une aide personnelle gratuite dans les domaines suivants:

(a) une orientation académique sur le choix de sujets appropriés en vue de l'obtention d'un titre universitaire;
(b) des tests, des entrevues, etc.;
(c) une consultation psychologique et personnelle.

(4) *Résidences*

Les résidences sont concues et organisées comme un service qui complète l'expérience éducative offerte par la Faculté Saint-Jean. Les étudiants qui demandent à être admis en résidence s'engagent à en accepter les règles, c.à.d. à vivre dans un milieu francophone, à étudier sérieusement, et à faire preuve d'esprit communautaire. Ces résidences, une pour les filles et

171.2 General Information

171.2.1 HISTORICAL NOTE AND AIMS

Collège Saint-Jean was founded in 1908, the same year as the inauguration of the Faculty of Arts and Sciences of The University of Alberta.

Though of the same age, the two institutions have evolved in very differing fashion. The Collège became Collège Universitaire Saint-Jean, an integral part and a bilingual sector of the University of Alberta, 62 years later on November 27, 1970. Official Faculty status was granted in September 1977, and the name changed to Faculté Saint-Jean in May 1978.

The goal of the Faculté must be, firstly, as the bilingual faculty, to allow students of French background to pursue their university studies in a French environment and, secondly, to allow students of English background to benefit by this environment.

The University thus hopes to foster French culture in Alberta and to allow more students to master the two official languages of Canada.

Faculté Saint-Jean is located at 8406 — 91 St. (about 3 kilometres east of the main University campus). This does not preclude the possibility of students following courses at Faculté Saint-Jean and in another faculty of the University, since a free mini-bus service is provided hourly between the two campuses.

171.2.2 SERVICES

(1) *Library Facilities*

The Faculté makes available to its professors and to its students a library which is well stocked with books in both languages intended for lending or consultation on the premises. All University students also have access to the libraries of The University of Alberta.

(2) *Centre de Documentation Pédagogique*

The Faculté also offers to education students and professors the services of the "Centre de Documentation Pédagogique" for consultation and loan of its French language materials.

(3) *Counselling*

The Faculté provides students with a specialized Counselling Service through which one can receive academic information or discuss more personal matters. Assistance is available in the following areas:

(a) academic guidance in choosing the appropriate subjects to obtain a university degree or certificate;
(b) tests, interviews, etc.;
(c) counselling.

(4) *Residences*

The residences are a service which complement the educational experience offered by the Faculté Students who ask for admission to residence comm themselves to the active pursuit of the goals of th residence, namely, to live in a French environment, t study seriously and to live in a community. Thes residences, one for females and one for males, are o

une pour les garçons, sont sur le campus de la Faculté et peuvent recevoir une centaine d'étudiants. Avec l'animateur de leur résidence, les étudiants s'organiseront pour réaliser au mieux les buts des résidences. Pour de plus amples renseignements, s'adresser au Service des Résidences.

Les étudiants ne désirant pas vivre en résidence peuvent trouver des appartements et des chambres, avec ou sans pension, à proximité du campus de la Faculté.

the Faculté campus and can accommodate approximately one hundred students. With the residence coordinator, the students are asked to establish the ways and means which will best aid them in the pursuit of the goals of the residence. More detailed information may be obtained by writing to the Information office.

Students who are not interested in living in residence can find room and board facilities in private homes and in apartments near the Faculté campus.

172 RÈGLEMENTS DE LA FACULTÉ

172.1 Conditions d'admission

Pour être admis à l'Université, un candidat de l'Alberta doit normalement avoir obtenu:

(1) le diplôme "Alberta High School"
(2) Un minimum de 60% de moyenne dans cinq matières appropriées de XII[e] année et une note de 50% au moins dans chacune des matières.
(3) Français 30, 31 ou Langue et Littérature 30 (ou l'équivalent).

Le détail des conditions d'admission aux divers programmes universitaires figure au paragraphe 13 de l'annuaire: "University Regulations and Information for students". Pour de plus amples renseignments, s'adresser au Bureau des Admissions, Faculté Saint-Jean.

Programme du Baccalauréat ès Arts
(1) Anglais 30
(2) Français 30, 31 ou Langue et Littérature 30
(3) Une matière du groupe A ou B (Etudes sociales 30 est conseillé)
(4) Une matière du groupe C (Sciences)
(5) Une matière du groupe A (Humanités) ou C (Sciences)

Programme du Baccalauréat en Education
(1) Anglais 30
(2) Français 30, 31 ou Langue et Littérature 30
(3) Une matière du groupe A (Humanités) ou C (Sciences)
(4) Une matière du groupe A (Humanités) ou C (Sciences)
(5) Une autre matière de XII[e] année comportant 5 crédits

Programme du Baccalauréat ès Sciences
(1) Anglais 30
(2) Français 30, 31 ou Langue et Littérature 30
(3) Mathématiques 30
(4) Une matière du groupe C (Sciences)
(5) Une matière du groupe C (Sciences)

172.1.1 CLASSIFICATION DES COURS REQUIS POUR L'INSCRIPTION

Les matières de XII[e] année acceptées par la Faculté se classent dans les trois groupes suivants:

Groupe A (Humanités)
(1) Etudes sociales 30
(2) Langue (autre que français ou anglais)

Groupe B (Beaux-Arts)
(1) Arts 30
(2) Arts 31
(3) Art commercial 32

172 REGULATIONS OF THE FACULTÉ

172.1 Admission Requirements

Every applicant for admission from the high schools of Alberta must normally possess:

(1) an Alberta High School diploma,
(2) an average of at least 60% on five appropriate examination subjects, and a mark of at least 50% in each,
(3) French 30, 31 or Langue et Littérature 30 (or an equivalent knowledge of French).

Detailed admission requirements for the various university programs are set out in Section 13 of the University Regulations and Information for Students' Calendar. Further information may be obtained from the Director of Admissions, Faculté Saint-Jean.

B.A. Program
(1) English 30
(2) French 30, 31 or Langue et Littérature 30
(3) Subject from Group A or B (Social Studies 30 recommended)
(4) Subject from Group C (Sciences)
(5) Subject from Group A (Humanities) or C (Sciences)

B.Ed. Program
(1) English 30
(2) French 30, 31 or Langue et Littérature 30
(3) Subject from Group A (Humanities) or C (Sciences)
(4) Subject from Group A (Humanities) or C (Sciences)
(5) Another Grade XII subject carrying weight of five credits

B.Sc. Program
(1) English 30
(2) French 30, 31 or Langue et Littérature 30
(3) Mathematics 30
(4) Subject from Group C (Sciences)
(5) Subject from Group C (Sciences)

172.1.1 CLASSIFICATION OF MATRICULATION SUBJECTS

Acceptable Grade XII subjects have been placed in three groups, as follows:

Group A (Humanities)
(1) Social Studies 30
(2) Language (other than English or French)

Group B (Fine Arts)
(1) Art 30
(2) Art 31
(3) Commercial Art 32

(4) Théâtre
(5) Musique 30
(6) Musique 31
(7) Art dramatique 32

Groupe C (Sciences)
(1) Biologie 30
(2) Chimie 30
(3) Mathématiques 30
(4) Mathématiques 31
(5) Physique 30

172.1.2 COMPÉTENCE DANS LA LANGUE ANGLAISE

1. Règlements généraux de l'Université de l'Alberta:

L'anglais est la langue d'enseignement principale dans toutes les facultés sauf à la Faculté Saint-Jean, où la langue d'enseignement principale est le français. Par conséquent, tous les candidats qui demandent l'admission à des facultés autres que la Faculté Saint-Jean doivent posséder une connaissance adéquate de l'anglais oral et écrit pour être admis à l'Université de l'Alberta. Aucune considération ne sera donnée au pays d'origine ni au statut de citoyenneté. Cette compétence pourra être démontrée de différentes manières:

(1) soit par la réussite de trois années d'études à temps plein dans une institution secondaire canadienne de langue anglaise;
(2) soit par la réussite d'une année de cours ou plus, incluant un cours complet d'introduction à la littérature anglaise dans une institution post-secondaire accréditée où la langue d'enseignement est l'anglais, et pour lesquels l'Université de l'Alberta peut donner des crédits;
(3) soit par la réussite de l'équivalent de trois années d'études à temps plein dans une école/institution en dehors du Canada, où les cours sont enseignés par des professeurs de langue anglaise accrédités par "The International Institute of Education" et reconnus par l'Université de l'Alberta;
(4) soit par la réussite de l'équivalent de trois années d'études à temps plein dans une école canadienne où la langue principale d'enseignement est autre que l'anglais, mais où le niveau de compétence en anglais est l'équivalent de celui exigé pour l'obtention du diplôme dans les écoles de langue anglaise reconnues par le Département provincial d'Education, ou,
(5) sur présentation de documents indiquant les résultats obtenus lors du TOEFL ("Test of English as a Foreign Language") ou d'autres résultats obtenus dans des tests réguliers reconnus.

Les candidats qui obtiennent une note de 600 au TOEFL (ou l'équivalent) seront considérés comme ayant démontré leur compétence dans la langue anglaise.

Ayant été désigné "centre officiel d'examens", l'Université de l'Alberta peut administrer une série de tests TOEFL durant toute l'année. Six examens spéciaux et six internationaux sont donnés durant l'année. Consulter "Examinations and Timetabling Division", Bureau du Registraire, 123, Edifice de l'Administration, Université de l'Alberta.

2. Règlements de la Faculté Saint-Jean

Les candidats qui demandent à être admis à la Faculté Saint-Jean ne sont pas tenus de démontrer leur compétence dans la langue anglaise. Toutefois, les candidats qui sont admis à la Faculté Saint-Jean et qui n'ont pas démontré cette compétence (selon les règlements généraux de l'Université notés ci-dessus) devront se soumettre aux conditions suivantes:

(4) Drama
(5) Music 30
(6) Music 31
(7) Performing Arts 32

Group C (Sciences)
(1) Biology 30
(2) Chemistry 30
(3) Mathematics 30
(4) Mathematics 31
(5) Physics 30

172.1.2 ENGLISH LANGUAGE PROFICIENCY FOR ADMISSION

1. General University requirements:

English is the primary language of instruction in all faculties except Faculté Saint-Jean, where French is the primary language. Therefore, all applicants to undergraduate faculties other than Faculté Saint-Jean must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language. This demonstration may take any one of several forms:

(1) successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;
(2) presentation of a successfully completed full-year or more of course work, including a full introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by The University of Alberta;
(3) successful completion of the equivalent of three years of full-time instruction in a school-institution outside of Canada where academic subjects are taught by "English Language" instructors, and accredited by the International Institute of Education (I.I.E.) or as recognized by the University of Alberta.
(4) successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education, or
(5) presentation of results of the English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

Having been designated as an official test centre the University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

2. Faculté Saint-Jean requirements:

Candidates for admission to Faculté Saint-Jean are not required to demonstrate proficiency in the English language as a prerequisite for admission. However, those candidates who are admitted to Faculté Saint-Jean and who have not demonstrated proficiency in English (as defined by the General University Requirements above) will be required to meet the following conditions:

(a) la réussite d'au moins un cours non-accrédité d' "Anglais langue seconde" durant la première année d'études; et

(b) la réussite de trois cours dont la langue d'enseignement est l'anglais, avant l'obtention de leur diplôme. Les nouveaux étudiants commencant leur troisième année de Baccalauréat en Education ne devront réussir qu'un et demi de ces trois cours. Il est également déconseillé aux étudiants faibles en anglais de s'inscrire à un cours de littérature anglaise avant d'avoir réussi le cours obligatoire d'Anglais langue seconde.

En dépit des conditions mentionnées ci-dessus, les étudiants qui obtiendront un total entre 500 et 599 au test du TOEFL ou à son équivalent seront exemptés du cours "d'Anglais langue seconde". De plus amples renseignements concernant ces conditions peuvent être obtenus du Responsable des Admissions à la Faculté Saint-Jean.

172.1.3 DÉFICIENCES LORS DE L'ADMISSION

Un candidat, faisant preuve d'insuffisance dans l'une des matières requises par la Faculté Saint-Jean, a la possibilité de pallier à cette insuffisance en suivant des cours normalement numérotés 100. La décision d'accepter ou non le cours en vue d'un crédit pour l'obtention du diplôme dépend du Doyen et de la nature de l'insuffisance. Un candidat présentant des insuffisances dans plusieurs matières ne pourra être admis.

172.1.4 ADULTES NE RÉPONDANT PAS AUX CONDITIONS D'ADMISSION

Les candidats adultes, âgés de 21 ans ou plus, qui ne répondent pas aux conditions d'admission officielles, peuvent solliciter une permission spéciale pour obtenir un diplôme à la Faculté Saint-Jean. Chaque demande sera prise en considération par le Doyen de la Faculté. Les candidats doivent être résidents de l'Alberta, du Yukon, ou des Territoires du Nord-Ouest et être citoyens canadiens ou immigrants reçus. Les candidats intéressés sont invités à soumettre un formulaire de demande au Bureau des inscriptions avant le 6 juin, et ils devront normalement prendre rendez-vous pour une entrevue avec le Service d'orientation des étudiants (Students Counselling Services). Tous les candidats adultes ne répondant pas aux conditions d'admission et souhaitant être admis doivent avoir suivi au moins un cours de Français 30, Français 31, ou Langue et Littérature 30, ou bien faire preuve d'un niveau de compétence équivalent dans la langue française. En outre, les candidats au programme de B.Sc. devront faire preuve d'une préparation adéquate en mathématiques et en sciences.

172.1.5 ADMISSION DES ETUDIANTS D'UNE AUTRE PROVINCE

Les étudiants d'une autre province canadienne dont le travail accompli correspond aux niveaux indiqués ci-dessous sont susceptibles d'être admis à la Faculté Saint-Jean, à condition qu'ils aient satisfait aux exigences des programmes choisis.

Ontario — Diplôme de treizième année.

Terre-Neuve — Réussite d'une année d'études de l'Université Memorial.

Québec — Réussite de la première année du programme de C.E.G.E.P. et obtention de résultats satisfaisants dans les matières requises.

Autres provinces — Diplôme de douzième.

(a) the successful completion of at least one non-credit English as a second language course, during the first year of study; and

(b) the completion of three courses which have English as the language of instruction, prior to the completion of their degree. New students entering third year of the Bachelor of Education program will be required to complete only one and one-half such courses. It is also strongly recommended that students lacking proficiency in English should not enrol in an English Literature course until completion of the English as a second language requirement. Notwithstanding the above, the English as a second language requirement may be waived for students who have obtained a score between 500 and 599 on the TOEFL, or its equivalent. Further information on these language requirements is available from the Director of Admissions at Faculté Saint-Jean.

172.1.3 MATRICULATION DEFICIENCY

Courses (usually numbered 100) at the Grade XII level are offered at the University for students who are beginning their study of a particular subject. A matriculant, deficient in *one* of the subjects required by Faculté Saint-Jean excepting French 30 or equivalent may be admitted to make up the deficiency. The decision as to whether or not the course will be accepted for degree credit rests with the Dean and depends on the nature of deficiency. A matriculant with more than one such deficiency is not eligible for admission.

172.1.4 NON-MATRICULATED ADULTS

Adult applicants twenty-one years and over who lack formal matriculation may seek special permission for a degree at Faculté Saint-Jean. Each application will be considered on its own merits by the Dean of the Faculty. Applicants must be residents of Alberta, the Yukon or the North West Territories who are Canadian citizens or permanent residents. Interested applicants should submit an application form to the Registrar's Office before June 6 and will normally be required to arrange an interview with Students Counselling Services. As a minimum, all candidates for non-matriculated adult admissions should present either French 30, French 31, Langue et Littérature 30 or demonstrate an equivalent level of competence in the French language. In addition, applicants for the B.Sc. program should provide evidence of adequate preparation in Mathematics and Sciences.

172.1.5 ADMISSION FROM ANOTHER PROVINCE

A student from another Canadian province who has successfully completed work at the standards shown below will be considered for admission to Faculté Saint-Jean provided they present subjects equivalent to the requirements of the appropriate programs.

Ontario — Grade XIII graduation.

Newfoundland — Successful completion of one year at Memorial University.

Quebec — Successful completion of the first year of the C.E.G.E.P. academic program with satisfactory performance in appropriate subjects.

Other provinces — Grade XII graduation.

172.1.6 ADMISSION DES ETUDIANTS D'UN AUTRE PAYS

Pour plus de renseignements, s'adresser au Bureau des admissions. (Voir aussi le paragraphe 13.23 de l'annuaire "University Regulations and Information for Students".

172.1.7 DEMANDE D'ADMISSION

La procédure d'admission est indiquée au § 14 de l'Annuaire: "University Regulations and Information for Students".

Aucune décision définitive quant à l'admission ne peut être rendue avant l'examen de tous les certificats et relevés de notes. La Faculté reçoit les étudiants et leur donne des conseils sur les programmes d'étude, mais toute décision reste *officieuse et provisoire* tant que les documents nécessaires n'ont pas été reçus et évalués.

172.1.8 APPELS ET GRIEFS

On encourage les étudiants à présenter leur griefs à leurs professeurs ou au Doyen. Si l'étudiant (e) n'obtient pas satisfaction, il/elle pourra faire appel auprès du Président du Comité d'Appel du Conseil Académique de la Faculté pour que celui-ci entende sa requête. Si l'étudiant ou l'intimé n'était pas satisfait par la décision dudit Comité, il/elle pourrait encore faire appel contre cette décision en s'adessant au "G.F.C. Academic Appeals Committee". (Se rapporter au paragraphe 16.7 des "University Regulations and Information for Students".)

172.2 Inscriptions

172.2.1 RENSEIGNEMENTS GÉNÉRAUX

Un étudiant inscrit à l'Université de l'Alberta dans une autre faculté peut suivre des cours à la Faculté Saint-Jean. Ces cours donnent des crédits équivalents à ceux obtenus dans des cours semblables suivis au campus ouest. Les candidats qui désirent suivre ces cours doivent en obtenir l'autorisation du Doyen de la Faculté Saint-Jean. Cette permission ne serait pas accordée à ceux qui ne désireraient suivre que Français 220.

Procédure d'Inscription. La procédure normale est indiquée au § 15 de l'Annuaire "University Regulations and Information for Students".

Changements d'Inscription. Les étudiants qui désirent changer leur inscription doivent en faire la demande au Bureau du Doyen de la Faculté. La date limite pour ces changements est indiquée au § 11.

Abandon de cours. Les dates limites pour se retirer d'un cours sont les suivantes: 12 février pour un cours complet; 12 novembre pour un demi-cours au 1er semestre; 1 mars pour un demi-cours au 2ième semestre.

Les étudiants qui désirent quitter la Faculté ou abandonner un cours doivent d'abord consulter un conseiller d'orientation pour remplir le formulaire approprié. Celui-ci sera ensuite présenté au Doyen pour approbation. Ceci doit se faire avant le 12 février pour un cours complet avant le 12 novembre pour un demi-cours au 1er semestre et avant le 1er mars pour un demi-cours au 2ième semestre.

172.1.6 ADMISSION FROM OUTSIDE CANADA

For further information, please contact the admissions office. (See also Section 13.23 of the University Regulations and Information for Students Calendar.)

172.1.7 APPLICATION FOR ADMISSION

Application procedure is explained in § 14 of the University Regulations and Information for Students Calendar.

No definite and final ruling concerning admission can be given until all certificates and transcription of standing have been reviewed. The Faculté consults with and advises students regarding programs of study, but all decisions are unofficial and tentative until documents have been received and evaluated.

172.1.8 APPEALS AND GRIEVANCES

Students are encouraged to bring grievances and problems to members of the Faculté or to the Dean of the Faculté. If students do not obtain satisfaction, they may direct an appeal to the Chairman of the Faculté academic Appeals Committee, who shall establish a hearing. If the Faculté Academic Appeals Committee should not satisfy the student or the respondent, the decision may be appealed to the General Faculties Council Academic Appeals Committee. (See 16.7 of the University Regulations and Information for Students Calendar.)

172.2 Registration

172.2.1 GENERAL INFORMATION

A student registered at The University of Alberta in another faculty may take courses offered at Faculté Saint-Jean. Credits given for these courses are equivalent to those given for comparable courses on the main campus. Candidates wishing to take these courses (with the exception of French 220) must obtain the consent of the Dean of the Faculté. Permission would not be granted to students wishing to take only Français 220.

Registration Procedure. The normal procedure for registration is that set out in § 15 of the University Regulations and Information for Students Calendar.

Change of Registration. Students wishing to change their registration must apply to the Dean's Office of the Faculté. The deadline for making changes is given in § 11.

Withdrawal from courses. The deadlines for withdrawing from courses are as follows: from a full-session course, February 12; from a single-term course offered in the First Term, November 12; from a single-term course offered in the Second Term, March 1.

A student who wishes to leave the Faculté or to abandon a course must first consult with a Counsellor to fill in an appropriate request form, which will be submitted to the Dean for acceptance. This must be done before February 12 for a full-session course; before November 12 for a single-term course in the First Term; before March 1 for a single-term course in the Second Term.

172.3 Classification des Cours

La classification des cours qui sont ou seront donnés à la Faculté Saint-Jean est la suivante:

Humanité's:

Anglais (les cours *junior* ne comptent pas pour l'exigence); Canadien-français; Etudes religieuses; Français; Histoire (classifiée aussi sous *Sciences sociales* mais ne peut compter que dans l'une ou l'autre catégorie): Lettres classique (sauf 367/368); Linguistique romane, Linguistique et Philosophie (voir la note pour "Histoire").

Beaux-Arts

Art Dramatique; LCLSS 367/368; Musique.

Sciences Sociales

Anthropologie; Economie, Histoire (voir note sous *Humanitie's*); Géographie (sauf 230/231, 309); Philosophie (sauf cours *junior;* voir note pour "Histoire" sous *Humanité's*); Psychologie (sauf cours classifiés sous *Sciences avec Laboratoire* et *Science*); Science politique; Sociologie; Linguistique et Linguistique romane (voir note pour "Histoire" sous *Humanité*).

Sciences avec laboratoire

Tous les cours en Biologie, Chimie, Entomologie, Géologie et Physique et, en plus, GEOGE 230/231 et PSYCE 360.

Sciences

Tous les cours sous *Science avec laboratoire* et, en plus, Mathématique et PSYCE 260, 309, 352, 361, 362, 375, 465 et 496.

Sciences de l'Education

Administration scolaire, Audio-visuel en Education, Curriculum et Méthodologie, Fondements de l'Education, Psychologie de l'Education.

172.4 Exigences Académiques

(1) Pendant l'année académique, on ne peut s'inscrire à plus de cinq cours complets ou l'équivalent, sans l'autorisation du Doyen. Durant sa 1ère année, un étudiant ne peut suivre des cours "senior" qu'avec la permission du Doyen.

(2) TOUT étudiant inscrit pour obtenir un diplôme de la Faculté Saint-Jean devra réussir, au cours de ses études, l'equivalent de cinq (5) cours complets dont la langue d'enseignement est le français, y compris un demi-cours senior enseigné en français dans une discipline autre que Français et Canadien-Français. Ce cours pourrait être, par exemple, Linguistique Romane ou un CU ME de français mais non un cours de Français ou de Canadien-Français.

a) Parmi les cinq (5) cours complets que l'étudiant devra suivre à la Faculté, il faudra inclure au moins deux (2) cours au niveau 300 dont le français sera la langue d'enseignement. On pourrait utiliser des cours de CA FR ou de Français, ainsi que les autres disciplines enseignées en français, pour répondre à cette exigence.

b) Un étudiant ayant déjà fait des études dans une université où la langue d'enseignement est le français pourrait être dispensé des obligations indiquées ci-dessus. Il sera tenu, cependant, à faire l'équivalent d'un minimum de cinq (5) cours complets à l'intérieur des cours donnés par l'Université de l'Alberta.

(3) TOUT étudiant inscrit à la Faculté devra suivre les cours de CA FR 320 et 322, et les réussir, pour

172.3 Classification of Courses

The courses offered at Faculté Saint-Jean are classified as follows:

Humanities: English (the junior courses do not meet the requirement); French-Canadian; Religious Studies; French; History (also classified under Social Sciences, but can only be counted in one or other category); Classics (except 367/368); Romance linguistics; Linguistics and Philosophy (see note for "History").

Fine Arts: Drama; LCLSS 367/268; Music.

Social Sciences: Anthropology, Economics, History (see note under *Humanities*); Geography (except 230/231, 309); Philosophy (except junior courses, see note for "History" under *Humanities*); Psychology (except courses classified under *Laboratory Science and Science*); Political Science; Sociology; Linguistics and Romance Linguistics (see note for "History" under *Humanities*).

Laboratory Science Courses: All courses in Biology, Chemistry, Entomology, Geology and Physics, plus GEOGE 230/231 and PSYCE 360.

Sciences: All courses under *Laboratory Sciences* plus Mathematics and PSYCE 260, 309, 352, 361, 362, 375, 465 and 496.

Education: Education-Administration; Education-Audiovisual; Education-Curriculum and Instruction; Education-Foundations; Education-Psychology.

172.4 Academic Requirements

(1) During the academic year, one may not register for more than five full courses or equivalent without approval of the Dean. A student in first year may take senior courses only with the approval of the Dean.

(2) To obtain a degree from Faculté Saint-Jean, each candidate must complete, during the program, the equivalent of five full year courses in which French is the language of instruction. This includes a senior half course taught in French (a subject other than Français or Canadien-Français). This course may be, for example, Linguistique Romane or a Curriculum/Méthodologie of French.

(a) Among the five full year courses the student must take at this Faculty, two full year courses at the 300 level, taught in French, must be included. Courses such as Canadien-Français, Français and other subjects taught in French may be applied to fulfil this requirement.

(b) However, a student who has previously studied at a University where French is the language of instruction may be exempted from the above-mentioned requirements, but must take the equivalent of at least five full year courses taught at The University of Alberta.

(3) To obtain a degree from Faculté Saint-Jean, each candidate must have successfully completed CA FR 320 and CA FR 322. (Under special circumstances and with the Dean's approval, certain equivalents could be accepted.)

obtenir son diplôme de la Faculté. (Dans certaines circonstances et avec l'autorisation du Doyen, des équivalences pourraient être acceptées.)

(4) TOUT étudiant inscrit à la Faculté Saint-Jean devra suivre FRANC 322 pour obtenir son diplôme de la Faculté.

NOTE: Ces règlements (2) (3) seront en vigueur à compter de septembre 1979. Les étudiants déjà inscrits à la Faculté seront régis par les anciens règlements mais pourront s'ils le désirent, se soumettre aux conditions énoncées ci-dessus.

(5) *Examen de Compétence Linguistique*

Tout étudiant inscrit depuis juillet 1976 à un diplôme offert par cette faculté, *devra* répondre aux exigences du Conseil des Examinateurs en ce qui concerne la compétence orale et écrite en français et en anglais. L'étudiant a la responsabilité de s'inscrire aux examens COM A et COM F.

Le relevé de notes des étudiants indiquera soit les résultats obtenus dans ces examens soit la note "échec" s'ils ne s'y sont pas présentés. La Faculté Saint-Jean offre un Certificat de Bilinguisme à ses diplômés qui auront obtenu une note de 6 ou plus dans l'examen de COM A et COM F. Ce certificat portera la mention "avec distinction" si l'étudiant obtient une note de 8 ou plus dans les deux examens.

Pour plus de renseignements contacter l'administrateur de l'examen de compétence linguistique — Faculté Saint-Jean.

(6) *Test de Classement en francais à la Faculté Saint-Jean*

Depuis le mois de septembre 1975, un test de classement est donné à tout étudiant d'une des catégories suivantes:

Catégorie I. Tout étudiant inscrit à la Faculté pour la première fois.

Catégorie II. Tout étudiant inscrit au FRANC 220/221 à Saint-Jean en 1978-79 mais qui aurait ensuite suivi un cours ou un programme d'été en français.

Catégorie III. Tout étudiant ayant déjà été inscrit dans un cours de français mais qui n'était pas inscrit dans cette Faculté en 1978-79.

Ce test de classement fait partie de l'effort continu, de la part de cette Faculté, d'améliorer l'efficacité des cours de français en permettant aux professeurs de mieux placer l'étudiant dans le cours pour lequel il est le plus qualifié et/ou qui répond le mieux à ses besoins particuliers.

Le test se compose de trois parties: *Compréhension orale, Lecture et Composition.* Les directives se donnent en anglais mais toutes les questions sont en français. On ne vous demandera pas de traduire. Les tests de Compréhension orale et de Lecture sont du type "choix multiple" tandis que pour le test de Composition, on vous demandera de remplir des cases de récrire des phrases, de combiner deux phrases en une seule et d'écrire ou de récrire un bref paragraphe.

Il n'y a aucun moyen de se préparer pour ce genre de test et il ne sert à rien de "potasser".

Il vous faudra environ deux heures pour effectuer les trois tests. Ceux-ci seront offerts *UNE SEULE FOIS, LE MARDI, 1 SEPTEMBRE, à 8H30.* Le numéro de la salle de classe où les tests seront offerts sera affiché au tableau d'information des étudiants dans le couloir central.

(7) *Exclusion de l'examen final.* Un étudiant peut se voir refuser la permission de passer l'examen final dans un cours, avec le consentement du Doyen, dans les circonstances suivantes:

(4) To obtain a degree from Faculté Saint-Jean, each candidate must take FRANC 322.

NOTE: The above-mentioned requirements, (2) (3), will be effective September 1979. The previous requirements will be applied to students registered before July 1979. Nevertheless, these students may be allowed to meet the above requirements, if they so wish.

(5) *Examination in Linguistic Competence:*

Students registered after July 1976: To be granted a degree from this Faculty, each candidate must submit to examining professors Council's, requirements regarding linguistic competence, both oral and written, in French and English. It is the student's responsibility to register for the COM A and COM F examination. The student's official transcript will indicate either the results obtained in those examinations or a failure if they did not sit for the examination. Faculté Saint-Jean offers a bilingual certificate to its graduates who will have obtained a grade of 6 or more on both COM A and COM F examinations. The certificate will indicate an honourable mention for those who have attained a grade 8 or more in both of the examinations.

For further information, please contact the administrator of the Linguistic Competence exam, Faculté Saint-Jean.

(6) *Placement Tests For French Courses Offered by Faculté Saint-Jean.*

A placement test in French will be given to all students who classify as follows:

Category I. Any student registering in this Faculty for the first time.

Category II. Any student who took FRANC 220/221 in 1978-1979 but who subsequently attended a summer session in French.

Category III. Any student previously enrolled in a French course at the 200 level but who was NOT enrolled at Saint-Jean in 1978-1979.

The placement test is being given as part of this Faculty's continuing effort to improve the efficiency of the various courses in French by allowing the staff to more judiciously place students in the specific course for which he/she is most qualified and/or which best meets his/her specific (remedial) needs.

The test has three separate parts: *Listening, Reading* and *Writing.* Directions are given in English but all of the questions are in French. You will not be asked to do any translation. Both Listening and Reading Tests are of the "multiple choice" type, while for the Writing Test, you will be asked to fill in blanks, rewrite sentences, combine two sentences into one and write or rewrite a short paragraph.

You cannot study for this type of test and last-minute "cramming" in vocabulary, grammar, etc. probably will not help you.

The tests require approximately two hours to complete. They will be administered *ONLY ONCE TUESDAY, SEPTEMBER 1, 8:30 a.m.* The number of the room in which the test will be administered will be posted on the student bulletin-board in the main hall way.

(7) *Debarment from final examination.* A student may be refused permission to write the final examination in a course, with the concurrence of the Dean, in the following circumstances:

(i) l'étudiant n'a pas remis un grand nombre des travaux écrits qui constituaient une partie importante du cours,
(ii) l'étudiant a manqué un trop grand nombre de laboratoires dans un cours de sciences.

(8) La note finale de chaque cours tient compte non seulement de l'examen final, mais aussi de l'ensemble des examens, des devoirs et des travaux faits au cours de l'année.

(i) The student has neglected to do a substantial proportion of the written assignments in a course of which these are an essential feature;
(ii) The student has neglected to do a substantial portion of the laboratory work in a science course.

(8) The final grade assigned in each course shall be determined not only by the final examination, but also by all examinations and assignments completed throughout the year.

173 PROGRAMMES D'ÉTUDES

173.1 Renseignements généraux

La Faculté Saint-Jean offre un programme bilingue en vue des B.A., B.Ed. et B.Sc. Un étudiant qui désire s'inscrire par la suite dans une autre Faculté peut cependant suivre à la Faculté Saint-Jean un programme d'Arts et/ou de Sciences de première année. Ce droit s'applique par exemple aux étudiants qui désirent s'inscrire par la suite en: Administration et Commerce, Art Dentaire, Economie Domestique, Pharmacie, Education Physique et Loisirs, Médicine, Sciences Médicales de Laboratoire, Médecine de Réhabilitation et autres. Pour tout autre renseignement à ce sujet, s'adresser au Doyen de la Faculté.

Le but de la Faculté est de permettre aux étudiants inscrits dans ces diverses facultés d'acquérir une meilleure connaissance de la langue et de la culture françaises.

173.2 Baccalauréat-ès-Arts

173.2.1 RÈGLEMENT GÉNÉRAL

Un étudiant inscrit au B.A. (général) ou B.A. (spécial) depuis septembre 1979 devra inclure dans son programme un plein cours tiré de chacune des catégories suivantes: Humanités, Beaux-Arts, Sciences Sociales et Science-Laboratoire.

173.2.2 DIPLÔME DE B.A. GENERAL

Le diplôme permet à l'étudiant d'obtenir une formation pluridisciplinaire en trois ans. Le schéma type de ce programme est le suivant:

Voie: Français 220

Première année
(1) Anglais (niveau 200)
(2) Français 220/222
(3) Science expérimentale
(4) Science sociale
(5) Option

Deuxième année
(1) Français 320/321
(2) Beaux Arts
(3) Option
(4) Option
(5) Option

Troisième année
(1) Canadien-Français 320/322

173 PROGRAMS OF STUDY

173.1 General Information

Faculté Saint-Jean offers a bilingual program towards the B.A., B.Ed., and B.Sc. degrees. A student who wishes to eventually register in a Faculty other than Arts, Science, or Education may often take all his/her first-year in a program of Arts and/or Science at Faculté Saint-Jean. This applies to students wishing to register eventually in: Business Administration and Commerce, Dentistry, Home Economics; Medicine, Pharmacy, Physical Education and Recreation, Medical Laboratory Sciences, Rehabilitation Medicine and others. For further information, contact the Dean of the Faculté.

The Faculté seeks to allow students registered in those faculties to develop their knowledge of the French language and culture.

173.2 The Degree of Bachelor of Arts

173.2.1 GENERAL REGULATION

Students beginning a B.A. (General), B.A. (Special) program in September 1979 and thereafter, will be required to include a course from each of the following categories in their program: Humanities, Fine Arts, Social Sciences and Laboratory Science.

173.2.2 GENERAL PROGRAM

The general program of Arts is designed to enable the student to obtain a diversified training in more than one branch of study within the limits of a three-year program. The student is required to take one LAB science, a Social Science and a Fine Arts course. The basic outline of the program is as follows:

Route: French 220

First year
(1) English (200 level)
(2) French 220/222
(3) Lab Science
(4) Social Science
(5) Option

Second year
(1) French 320/321
(2) Fine Arts
(3) Option
(4) Option
(5) Option

Third year
(1) French-Canadian 320/322

(2) Français 322 / ½ option
(3) Option
(4) Option
(5) Option

Voie: Canadien Français 220

Première année
(1) Anglais (niveau 200)
(2) Canadien-Français 220 / 222
(3) Science expérimentale
(4) Science sociale
(5) Option

Deuxième année
(1) Français 322 / ½ option
(2) Beaux Arts
(3) Option
(4) Option
(5) Option

Troisième année
(1) Canadien-Français 320 / 322
(2) Option
(3) Option
(4) Option
(5) Option

Le programme est soumis aux règlements suivants:

(1) Tout étudiant qui s'inscrit en vue d'un B.A. doit choisir sa spécialisation principale en humanités, sciences sociales ou mathématiques. Pour obtenir un B.A., l'étudiant doit avoir obtenu les crédits nécessaires dans au moins huit cours d'Arts.

(2) Tout étudiant doit inclure dans son programme d'études un minimum de trois cours et un maximum de cinq dans sa spécialisation, et un minimum de trois cours et un maximum de quatre dans une spécialisation secondaire.

(3) Aucun étudiant ne peut inclure plus de sept cours "junior" dans son programme d'études, sauf par autorisation spéciale du Doyen.

(4) Pour obtenir un B.A., l'étudiant doit avoir obtenu une note égale ou supérieure à 4 dans un minimum de quatorze cours complets, une note égale ou supérieure à 3 dans un quinzième cours complet ou équivalent (pourvu que ce cours ne fasse pas partie de la spécialisation du candidat), et une moyenne d'au moins 5.0 dans tous les cours crédités suivis en vue du diplôme après la première année.

(5) Un étudiant ne peut pas se présenter à plus de deux examens de reprise par an, que ce soit en vue d'obtenir les points suffisants ou d'élever sa moyenne au minimum requis de 5.0.

(6) Un étudiant ne peut pas se présenter à plus de cinq examens de reprise en tout pendant ses trois années d'études.

(7) Dans certains cas exceptionnels, le Doyen peut autoriser un étudiant à passer plus de trois ans à l'obtention de son diplôme ou à remplir plus rapidement les conditions requises en suivant les cours de la Session de Printemps ou d'Eté ou en suivant des cours supplémentaires pendant la Session d'Hiver.

(8) Tout étudiant en possession de crédits post-secondaires qui s'inscrit à la Faculté devra suivre au moins cinq de ses quinze cours à l'Université de l'Alberta en vue de recevoir le diplôme de cette Université.

(9) Pour être admis dans un cours exigeant un prérequis, une note d'au moins 4 doit être obtenue dans le cours prérequis.

(10) 4 cours au maximum peuvent être suivis avec crédit dans une matière autre que la matière principale.

(11) Après avoir satisfait aux exigences de première année, l'étudiant peut choisir deux cours dans des domaines autres que les Arts et les Sciences.

(2) French 322 / ½ option
(3) Option
(4) Option
(5) Option

Route: French-Canadian 220

First year
(1) English (200 level)
(2) French-Canadian 220 / 222
(3) Lab Science
(4) Social Science
(5) Option

Second year
(1) French 322 / ½ option
(2) Fine Arts
(3) Option
(4) Option
(5) Option

Third year
(1) French-Canadian 320 / 322
(2) Option
(3) Option
(4) Option
(5) Option

The following regulations govern the program:

(1) A student registering for the B.A. degree mus choose a principal subject of concentration in the hu manities, social sciences or mathematics. To obtain B.A., the student must present credit in at least eigh Arts courses.

(2) Each student must include in the program a mini mum of three courses and a maximum of five in a princi pal subject of concentration, and a minimum of thre and a maximum of four in a second subject of concen tration.

(3) No student may include more than seven junio courses in the program, except by special permissio of the Dean.

(4) To obtain a B.A., a student must present a grad of 4 or better in a minimum of fourteen full-sessio courses, not less than a grade of 3 in a fifteenth fu session course or equivalent (provided this is not course in a subject of concentration), and a grade-poi average of at least 5.0 in all courses credited to the de gree after the first year.

(5) A student may not write more than tw supplemental examinations in any year, whether for th purpose of obtaining passing marks or of raising his her grade-point average to the required 5.0.

(6) A student may not write more than fiv supplemental examinations in the three-year program

(7) In exceptional circumstances, the Dean may pe mit a student to proceed to a degree over a long period than three years, or to meet the requirements a shorter time by attending Spring Session or Summ Session or taking extra courses during the Wint Session.

(8) Students transferring to the Faculté with a vanced standing will be required to complete at lea five of their fifteen courses at The University of Alber to qualify for the University's degree.

(9) For admission to a course with a prerequisite r quirement a grade of at least 4 must be obtained in t prerequisite course.

(10) No more than 4 courses may be taken for d gree credit in a subject other than the subject of co centration.

(11) After completion of first year requirements, student may include *two courses* chosen from outsi the Arts and Sciences.

§ § 43.2 to 43.21 of the Faculty of Arts and Scien Calendar contain advice offered by the various Arts d

On pourra consulter l'Annuaire de la Faculté des Arts et des Sciences § § 43.2 à 43.21, pour y trouver des renseignements concernant les cours offerts par les divers départements et les cours requis par chaque spécialisation.

173.2.3 DIPLÔME DE B.A. SPÉCIAL

Le programme de B.A. spécial est destiné à procurer aux étudiants une formation variée recouvrant plusieurs domaines d'étude, mais offrant en même temps un plus grand degré de spécialisation dans un domaine déterminé que ne le permet le programme général.

Le B.A. spécial comporte une série de 20 cours qui sont normalement suivis sur une période de 4 ans. Deux choix importants sont exigés: une matière principale au choix dans le domaine des Beaux-Arts, Humanités, Sciences sociales ou Mathématiques, et une matière secondaire dans les Arts ou les Sciences.

(1) Un minimum de cinq cours est exigé dans la matière principale, dont au moins quatre doivent être des cours "senior"; un maximum de huit cours est autorisé. Un minimum de quatre cours est exigé dans la matière secondaire et un maximum de cinq cours est autorisé.

(2) Tout étudiant doit avoir au moins onze cours en Arts.

(3) Conditions de résidence:

(a) Tout étudiant inscrit dans un programme de B.A. spécial doit avoir au moins dix cours complets pris à l'Université de l'Alberta.

(b) La dernière année du programme de B.A. spécial devra normalement correspondre à une année académique régulière et devra être suivie à l'Université de l'Alberta. Les conseillers des étudiants peuvent éventuellement recommander au Doyen une exemption à ce dernier règlement. Si l'étudiant a satisfait aux conditions énoncées sous (a) avant le début de la dernière année, il peut solliciter auprès du Doyen l'autorisation de suivre un ou plusieurs de ses cinq derniers cours dans une autre université.

(4) Exigences académiques:

Pour obtenir un B.A. spécial, un étudiant doit recevoir une note de 4 ou davantage dans au moins 19 (dix-neuf) cours, un minimum de 3 dans le vingtième cours (à condition qui celui-ci ne soit pas un cours faisant partie de l'une des deux matières principales) et une moyenne générale d'au moins 5.0 dans les dix derniers cours du programme. Le règlement concernant les examens de reprise est le même que celui du B.A. général.

Note: Voir les autres règlements au § 43.1.3 dans l'annuaire de la Faculté des Arts.

173.2.4 NOTES ACADEMIQUES ET DIPLOMES

Les règlements ci-dessous s'appliquent à tous les étudiants des Arts.

(1) Le privilège de refaire une année ne sera pas accordé à un étudiant plus d'une fois pendant son cours à la Faculté, sauf par autorisation du Doyen.

(2) Pour poursuivre ses études à la Faculté, un étudiant qui recommence une année doit obtenir une moyenne de 5.0 pendant cette année, pour montrer qu'il a atteint le niveau requis.

S'il n'obtient pas cette moyenne, il doit quitter la Faculté Saint-Jean; il pourra y être réadmis plus tard s'il a atteint le niveau voulu dans une autre Faculté.

Il y a des variantes parmi les règlements des différents programmes. Les règlements de la Faculté Saint-Jean sont les mêmes que ceux des Facultés des partments to students selecting courses in their subjects of concentration.

173.2.3 THE DEGREE OF B.A. SPECIAL

The B.A. Special program is designed to enable a student to obtain a diversified education in more than one branch of study, but with a greater degree of specialization in a particular field than is available in the General program.

The B.A. Special consists of a twenty courses program usually taken in four years. Two concentrations are required: a principle subject chosen from the Fine Arts, Humanities, Social Sciences or Mathematics and a second subject which may be chosen in either Arts or Science.

(1) In the principle subject a minimum of five courses is required, at best four of which must be senior courses; a maximum of eight courses is permitted. In the second subject a minimum of four courses is required and a maximum of five courses is permitted.

(2) A student must secure credit in at least eleven Arts courses.

(3) Residence requirements:

(a) A student proceeding toward the B.A. Special must have credit for at least ten full year courses at the University of Alberta.

(b) The final year of the B.A. Special program will normally be taken in one regular academic year in attendance at the University of Alberta campus. The student counsellors may recommend to the Dean exemption from this regulation. If the student has fulfilled the requirement for (a) prior to the beginning of the final year he may apply to the Dean for permission to take one or more of his final five courses elsewhere.

(4) Academic performance:

To qualify for a B.A. Special, a student must present a grade of 4 or better in a minimum of 19 (nineteen) courses, no less than a 3 in a twentieth course (provided this is not a course in either subject of concentration) and a grade point average of at least 5.0 in the last ten courses of the program. Rules concerning Supplemental examinations are the same as for the B.A. General. Note: See other regulations in § 43.1.3 of the Arts calendar.

173.2.4 ACADEMIC STANDINGS AND GRADUATION

The following regulations apply throughout the Arts' program:

(1) The privilege of repeating a year will be granted to a student not more than once during his/her candidacy for a degree in the Faculté, unless by special permission of the Dean.

(2) To continue in the Faculté, students who are repeating a year must demonstrate ability to meet graduation standards by attaining a grade-point average of 5.0 in the repeated year. If they do not, they must withdraw from the Faculté; they may be re-admitted later if they have achieved graduation standards in another Faculty.

Further regulations regarding academic standing, promotion, and graduation vary from program to pro-

Arts et des Sciences. On trouvera ces règlements au § 43 de l'Annuaire de la Faculté des Arts et au § 183 de l'annuaire de la Faculté des Science.

173.3 Baccalauréat en Education

173.3.1 RENSEIGNEMENTS GENERAUX

La Faculté Saint-Jean offre deux programmes en vue du B.Ed. Les candidats ayant complété avec succès leurs années d'études obtiendront un Baccalauréat en Education et seront recommandés pour un Brevet d'enseignement temporaire (Interim Professional Certificate).

(1) *Le programme de 4 ans* dans lequel sont admissibles les étudiants détenteurs de la 12e année. L'unité d'enseignement étant le demi-cours, il faut compter 40 demi-cours, soit 120 crédits, pour réussir le B.Ed.

(2) *Le programme de 2 ans* offert aux détenteurs d'un grade universitaire de premier cycle (B.A., B.Sc. ou autre) qui ont l'intention de se diriger vers l'enseignement. L'unité d'enseignement étant le demi-cours, il faut compter 20 demi-cours, soit 60 crédits pour réussir le B.Ed.

N.B.

Le programme du B.Ed. est en voie de développement et sujet à plusieurs approbations avant d'être définitif. On peut obtenir le dépliant expliquant le programme en éducation auprès du Service d'Information (121) en composant le numéro 466-2196, poste 33.

173.3.2 NOTES ACADEMIQUES

(1) La moyenne requise dans tous les cours en vue du diplôme comme du certificat est de 4.

(2) Pour avoir le titre de B.Ed., tout étudiant doit obtenir une moyenne d'au moins 5.0 dans tous les cours utilisés comme crédits pendant les trois dernières années de son programme d'études.

(3) Afin de pouvoir recevoir le premier certificat, tout étudiant doit obtenir une moyenne d'au moins 5.0. N.B.: l'ancien règlement s'applique cependant aux candidats au titre de B.Ed. inscrits à ce programme avant le 1er septembre 1969.

(4) Tout étudiant, en possession de crédits post-secondaires, s'inscrivant au programme du B.Ed. à l'Université de l'Alberta, doit obtenir une moyenne d'au moins 5.0 dans tous les cours suivis à l'Université de l'Alberta et utilisés comme crédits en vue de son diplôme.

(5) Pour être admis dans un cours exigeant un prérequis, une note d'au moins 4 doit être obtenue dans le cours prérequis.

(6) Pendant les quatre années de son programme, aucun étudiant ne peut recevoir de crédit pour plus de deux cours complets, ou de leur équivalent, où il a obtenu un 3.

(7) Aucun étudiant ne pourra se présenter à un examen de reprise dans plus de deux cours complets (ou de leur équivalent) pendant une année.

(8) Pendant le programme de quatre ans conduisant au Baccalauréat en Education, aucun étudiant ne pourra se présenter à un examen de reprise dans plus de cinq cours (ou de leur équivalent).

(9) Tout étudiant qui, pendant la session normale de reprise des examens, est retenu par son poste d'enseignement, peut, avec la permission du Doyen, se présenter à ses examens de reprise à la fin de la

gram. Faculté Saint-Jean regulations are the same as those of the Faculty of Arts, and are, therefore, given together with the details of the program to which they apply in § 43 of the Faculty of Arts and in § 183 of the Faculty of Science Calendar.

173.3 The Degree of Bachelor of Education

173.3.1 GENERAL INFORMATION

The Faculté offers two programs towards the B.Ed. Students having successfully completed their studies will obtain a B.Ed. and will be recommended for the Interim Professional Certificate.

I. *The 4 year program* to students meeting admission requirements normally after completion of their Grade 12. The program consists of 40 half-course equivalents or 120 credits.

II. *The 2 year program* to holders of approved undergraduate degrees (B.A., B.Sc. or other). The program consists of 20 half-course equivalents or 60 credits. —N.B. The B.Ed. program is under revision and subject to many changes before finalization. Please ask for the brochure explaining the B.Ed. program at the Information Office (121) or telephone 466-2196 extension 33.

173.3.2 ACADEMIC STANDINGS

(1) The pass mark in all courses in both degree and certification programs is a grade of 4.

(2) To be granted the B.Ed. degree a student must obtain a grade-point average of at least 5.0 on all courses credited towards the last three years of the degree program.

(3) To be recommended for the first certificate a student must obtain a grade-point average of at least 5.0. NOTE: For students admitted to the B.Ed. program prior to September 1, 1969, the former regulations will apply.

(4) A student transferring to the B.Ed. program at The University of Alberta with Advanced Standing must obtain a grade-point average of at least 5.0 in all courses completed at The University of Alberta for credit towards the degree.

(5) For admission to a course with a prerequisite requirement a grade of at least 4 must be obtained in the prerequisite course.

(6) A student may not obtain credit for more than two full-session courses or equivalent with a grade of 3 during the four-year program.

(7) A student will not be allowed to write supplemental examinations on more than two full-session courses (or the equivalent) in any one year.

(8) A student will not be allowed to write supplemental examinations on more than five-session courses (or equivalent) on the four-year B.Ed. program.

(9) A teacher who, during the regular Supplemental Examination period, is in a teaching position may, with the approval of the Dean, write the supplemental examination at the end of the Summer Session. If an examination in the required subject is on the regular schedule, the fee for the supplemental is $15.00. If

Session d'Eté. Si l'examen requis fait partie du programmme normal d'examens, les frais de reprise d'examen sont de $15.00. Si un examen spécial doit être préparé, les frais, sont de $60.00.

(10) Un étudiant qui ne réussit pas dans un cours de printemps ou d'été ne se verra pas accorder de privilège de reprise.

(11) Il n'existe pas de privilège de reprise en ce qui concerne le stage d'enseignement.

(12) Aucun étudiant ne pourra recommencer un cours plus d'une fois.

(13) Aucun étudiant ne pourra refaire plus d'une année pendant son programme d'études.

(14) Un étudiant qui recommence une année ne peut se présenter à un examen de reprise pour aucun des cours suivis cette année-là, et il devra obtenir une note égale ou supérieure à 4.6 dans tous les cours pour être admis à continuer.

(15) Le maximum de cours supplémentaires, y compris les cours repris, auxquels un étudiant peut s'inscrire pendant un cycle d'études de B.Ed., ne peut dépasser de plus de 5 le nombre total de cours exigés pour tout programme de B.Ed.

(16) Pour l'obtention du diplôme en Education (B.Ed.) de la Faculté Saint-Jean, les étudiants dont la spécialisation est le français, niveau secondaire, DEVRONT réussir Linguistique Romane 320 et 321.

(17) On pourra consulter l'annuaire de la Faculté d'Education, § 73, pour les détails des programmes particuliers.

173.4 Baccalauréat-ès-Sciences

173.4.1 PROGRAMMES GENERAUX

Le programme général pour l'étude des Sciences permet à l'étudiant d'obtenir une formation pluridisciplinaire au terme d'un programme de trois ans. Le schéma type de ce programme est le suivant:

Voie: Français 220

Première année
(1) Français 220/222
(2) Science
(3) Science
(4) Science
(5) Option

Deuxième année
(1) Français 320/321
(2) Science
(3) Science
(4) Science
(5) Option

Troisième année
(1) Canadien-Français 320/322
(2) Français 322/½ option
(3) Science
(4) Science
(5) Option

Voie: Canadien-Français 220

Première année
(1) Canadien-Français 220/222
(2) Science
(3) Science
(4) Science
(5) Option

Deuxième année
(1) Français 322/½ Cours d'Arts
(2) Science
(3) Science

special examination paper must be prepared, the fee is $60.00.

(10) A student who fails a course in the Spring or Summer Session will not be granted a supplemental privilege.

(11) There is no supplemental privilege in student teaching.

(12) A student will not be granted the privilege of repeating a failed course more than once during the degree program.

(13) A student will not be granted the privilege of repeating a failed year more than once during the degree program.

(14) A student who is repeating a year will be granted no supplemental privileges in the courses taken that year and must pass all courses with a grade-point average of at least 4.6 to be allowed to continue.

(15) The maximum number of additional courses, including repeated courses, in which a student may enrol during a B.Ed. program may not exceed by more than five the number of courses required for completion of any B.Ed. program.

(16) To obtain the B.Ed. Degree from Faculté Saint-Jean, students with French as their major in the secondary route must successfully complete Linguistique Romane 320 and 321.

(17) For details of specific programs consult § 73 of the Faculty of Education Calendar.

173.4 The Degree of Bachelor of Science

173.4.1 GENERAL PROGRAMS

General programs in Science are designed to enable student to obtain diversified training in more than one branch of study within the limits of a three-year program. The basic outline of the program is as follows:

Route: French 220

First year
(1) French 220/222
(2) Science
(3) Science
(4) Science
(5) Option

Second year
(1) French 320/321
(2) Science
(3) Science
(4) Science
(5) Option

Third year
(1) French-Canadian 320/322
(2) French 322/½ option
(3) Science
(4) Science
(5) Option

Route: French-Canadian 220

First year
(1) French-Canadian 220/222
(2) Science
(3) Science
(4) Science
(5) Option

Second year
(1) French 322/½ Arts course
(2) Science
(3) Science

(4) Science
(5) Option

Troisième année
(1) Canadien-Français 320/322
(2) Science
(3) Science
(4) Option
(5) Option

Le programme est soumis aux règlements suivants:

(1) Tout étudiant doit inclure dans son programme d'études un minimum de trois cours et un maximum de six dans sa spécialisation principale, et un minimum de trois cours et un maximum de quatre dans une spécialisation secondaire.

(2) Aucun étudiant ne peut inclure plus de sept cours "junior" dans son programme, sans une autorisation spéciale du Doyen.

(3) Un étudiant qui veut obtenir le diplôme de B.Sc. doit choisir sa spécialisation dans les sciences physiques, biologiques ou mathématiques. Cet étudiant doit réussir dans au moins huit cours de sciences.

(4) Pour l'acquisition d'un B.Sc., un étudiant doit obtenir une note égale ou supérieure à 4 dans un minimum de quatorze cours complets, une note égale ou supérieure à 3 dans un quinzième cours (pourvu que ce cours ne fasse pas partie de sa spécialisation), et une moyenne d'au moins 5.0 dans tous les cours de la première année.

(5) Aucun étudiant ne peut se présenter à plus de deux examens de reprise par an, que ce soit en vue d'obtenir les points suffisants, ou d'élever sa moyenne au minimum requis de 5.0.

(6) Aucun étudiant ne peut se présenter à plus de cinq examens de reprise durant son programme de trois ans.

(7) Dans certains cas exceptionnels, le Doyen peut autoriser un étudiant à passer plus de trois ans à l'obtention de son diplôme ou à remplir plus rapidement les conditions requises en suivant les cours de la Session de Printemps ou d'Été ou en suivant un programme plus chargé pendant la Session d'Hiver.

(8) Tout étudiant en possession de crédits post-secondaires, qui s'inscrit à la Faculté, devra suivre au moins cinq de ses quinze cours à l'Université de l'Alberta pour recevoir le diplôme de l'Université.

(9) Pour être admis dans un cours exigeant un prérequis, une note d'au moins 4 doit être obtenue dans le cours prérequis.

173.4.2 NIVEAU ACADEMIQUE ET DIPLOMES

Les règlements ci-dessous s'appliquent à tous les étudiants de la Faculté des Sciences.

(1) Pour obtenir plus d'une fois le privilège de refaire une année pendant son programme, l'étudiant a besoin de l'autorisation spéciale du Doyen.

(2) Un étudiant qui refait une année ne peut prétendre à aucun privilège particulier pour les cours suivis cette année-là. Il doit obtenir une moyenne finale de 5.0 s'il veut continuer.

Il y a des variantes parmi les règlements de différents programmes. Généralement les règlements pour le baccalauréat es Sciences de la Faculté sont les mêmes que ceux de la Faculté des Sciences. On trouvera ces règlements au § 183 de l'Annuaire de la Faculté des Arts et des Sciences.

(4) Science
(5) Option

Third year
(1) French-Canadian 320/322
(2) Science
(3) Science
(4) Option
(5) Option

The following regulations govern the programs:

(1) Each student must include in the program a minimum of three courses and a maximum of six in a principal subject of concentration, and a minimum of three and a maximum of four in a second subject of concentration.

(2) No student may include more than seven junior courses in the program, except by special permission of the Dean.

(3) A student registering for the B.Sc. degree must choose a principal subject of concentration in the physical or biological sciences or mathematics. To obtain a B.Sc., the student must pass at least eight science courses.

(4) To obtain a B.Sc., a student must present a grade of 4 or better in a minimum of fourteen full-session courses, not less than grade 3 in a fifteenth course (provided this is not a course in a subject of concentration), and a grade-point average of at least 5.0 in all courses credited to the degree after the first year.

(5) Students may not write more than two supplemental examinations in any year, whether for the purpose of obtaining passing marks or of raising the grade-point average to the required 5.0.

(6) A student may not write more than five supplemental examinations in the three-year program.

(7) In exceptional circumstances, the Dean may permit a student to proceed to a degree over a longer period than three years, or to meet the requirements in a shorter time by attending Spring Session or Summer Session or taking extra courses during the Winter Session.

(8) Students transferring to the Faculté with advanced standing will be required to complete at least five of their fifteen courses at The University of Alberta to qualify for the University's degree.

(9) For admission to a course with a prerequisite requirement a grade of at least 4 must be obtained in the prerequisite course.

173.4.2 ACADEMIC STANDINGS AND GRADUATION

The following regulations apply throughout the Faculty of Science:

(1) Students may be granted the privilege of repeating a year not more than once during their candidacy for a degree in the Faculty unless by special permission of the Dean.

(2) A student who is repeating a year will be granted no supplemental privileges in the courses taken that year, and must pass all courses and obtain a grade-point average of at least 5.0 to be allowed to continue in the Faculty.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are therefore given in § 183 of the Faculty of Arts and Science Calendar.

173.5 Options

Le terme "option", désigne le cours qu'un étudiant peut choisir librement s'il a les prérequis voulus. "Approved option" est une option approuvée par le département qui dirige le programme de l'étudiant en question.

174 DETAIL DES COURS

174.1 Renseignements Généraux

La langue d'enseignement (le français ou l'anglais) est donnée par la description du cours. Ainsi, par exemple, GEOGE 230 (Géographie 230) est décrit en français parce que le français est la langue d'enseignement en Géographie 230, tandis que ANGL 200 (Anglais 200) est décrit en anglais parce que ce cours est enseigné en anglais.

Le numéro de chaque cours est précédé d'un sigle qui identifie la matière. Les étudiants doivent se servir de cette abréviation et de ce numéro lorsqu'ils complètent les formulaires d'inscription.

Tous les numéros de 100 à 199 indiquent les cours préparatoires et correspondent généralement à ceux de l'école secondaire. Les numéros 200 à 299 concernent les étudiants de première année. Ceux qui sont répertoriés de 300 à 499 représentent des cours "senior" et s'adressent aux étudiants qui ont terminé leur première année. Les cours répertoriés 500 et au-dessus sont réservés aux étudiants "senior" et à ceux qui poursuivent des études supérieures.

Après le titre du cours, le signe "★" indique la valeur de ce cours et le chiffre sert à l'ordinateur pour calculer le résultat final. Un cours donné pendant une année académique a une valeur de 6 points. Un demi-cours correspond à 3 points. Certains cours qui exigent un travail de recherche peuvent avoir une valeur différente qui dépend de la durée et des difficultés de la recherche.

Les trois sigles placés entre parenthèses, présentent le nombre d'heures de cours par semaine. Le premier sigle indique les heures de cours; le deuxième sigle représente les heures de séminaire (s), démonstration (d), clinique (c) ou cours de laboratoire (); le troisième sigle indique le nombre d'heures de laboratoire, combiné avec un cours. L'expression 3/2" signifie trois heures de classe une semaine sur deux. Le nombre d'heures d'un cours est le même pendant les deux semestres sauf indication contraire. Pour un demi-cours, le semestre pendant lequel il est donné est indiqué avant le nombre d'heures de cours.

Demi-cours. Certains cours ne se donnent que pendant un semestre; deux de ces cours sont considérés comme un cours complet. S'il s'agit d'une option, deux demi-cours différents pourront être associés pour remplir les conditions nécessaires.

Cours à inscriptions limitées: Dans certains cours, l'effectif des classes doit être réduit pour des raisons académiques. Ces cours figureront dans l'horaire sous le titre "cours à inscriptions limitées". Si le nombre d'inscriptions pour un tel cours est trop grand, les étudiants dont le programme n'exige pas le dit cours devront annuler leur inscription.

173.5 Options

The term "option", where it appears in the programs, means a course freely chosen by students provided they have the necessary prerequisite. An "approved option" is an option approved by the department directing the program of the student concerned.

174 DETAILS OF COURSES

174.1 General Information

The language (French or English) used in describing the course indicates the language of instruction. For example, GEOGE 230 (Géographie 230) is described in French because it is taught in French, whereas ANGL 200 (English 200) is described in English, because it is taught in English.

Each course is designated by its computer abbreviation and a number. Students could use this abbreviation and number when filling in their registration forms.

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 and up are normally restricted to senior and graduate students.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. An ordinary full-session course is weighted 6. A single-term course is normally weighted 3. Some courses involving research may vary in weight according to the length and difficulty of the research project.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. The hours of instruction for a full-session course are the same in both terms unless otherwise indicated. If the course is a single-term course, the term in which it may be offered is mentioned before the hours of instruction.

Single-term courses. A number of courses are offered in one term only; two such courses are recognized as the equivalent of one full-session course. Where the curriculum requires a full-session course in a particular subject or classification, both single-term courses must be chosen from that subject or classification; where the requirement is for an option, any two single-term courses may be combined to meet the requirement.

Restricted Enrolment Courses: Classes in some courses must for academic reasons be restricted in size. Such courses will be labelled "restricted enrolment" courses in the timetable. If such a course is found to be oversubsribed, students whose programs do not require that course may be required to delete it from their registration.

LE FAIT QUE LA DESCRIPTION D'UN COURS FIGURE DANS CET ANNUAIRE N'IMPLIQUE PAS NECESSAIREMENT QUE CE COURS SERA EFFECTIVEMENT DONNE PENDANT LA SESSION ACADEMIQUE A VENIR. TOUTE INFORMATION RELATIVE AUX COURS QUI SERONT DONNES, AUX NOMS DES PROFESSEURS QUI LES ASSURERONT, OU A TOUT AUTRE DETAIL, SERA FOURNIE PAR LE BUREAU DU DOYEN DE LA FACULTÉ.

THE APPEARANCE OF A COURSE DESCRIPTION, IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEAN'S OFFICE.

174.2 Administration Scolaire / Educational Administration

ADMSC 301. *Résultats de la planification et de la gestion dans les écoles.* ★3 (demi-cours, 3-0-0). Prérequis ou corequis: ADMSC 461.

ADMSC 401. *Le Rôle du Professeur.* ★3 (2e semestre, 3-0-0). Antérieurement ADMSC 461.

174.3 Anglais / English

NOTE: Un seul cours plein (ou 2 demi-cours) au niveau 200 peut être crédité pour le B.A.

ANGL 150. *English as a Second Language.* ★0 (2 semestres, 3-0-0). Designed to enable francophone students to develop practical skills in spoken and written English. Course includes grammar, composition and conversation. Students registered at Faculté Saint-Jean who do not have ENGL 30 or an euivalent must take this course and successfully complete it.

ANGL 200. *A Survey of English Literature from Chaucer to the Twentieth Century.* ★6 (3-0-0). A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ANGL 215. *Introduction to the Study of Literature.* ★3 (either term, 3-0-0). A close reading of significant works of prose in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ANGL 260 and 265.

ANGL 260. *Studies in the Earlier English Literary Tradition.* ★3 (First Term, 3-0-0). An introduction to representative prose and verse, including drama, from the beginnings to Milton.

ANGL 265. *Studies in the Later English Literary Tradition.* ★3 (Second Term, 3-0-0). An introduction to representative prose and verse, including drama, from Dryden to the present.

ANGL 270. *Readings in Poetry.* ★3 (First Term, 3-0-0). A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry. Prerequisite: ANGL 215.

ANGL 275. *Readings in Prose.* ★3 (single term, 3-0-0). A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the students to ways of approaching prose, and to assist them in reading critically. Prerequisite: ANGL 215.

ANGL 284. *Canadian Literature in Process.* ★3 (single term, 3-0-0). An intensive reading of mainly contemporary Canadian novels, stories, poems and plays, in English. Prerequisite: ANGL 215.

ANGL 288. *An Introduction to the English Language.* ★6 (3-0-0). (Education) A historical and structural study of the sounds, grammar, and vocabulary of English.

ANGL 290. *The Craft of Writing.* ★3 (Second Term, 3-0-0). A study of techniques of expository writing, intended to increase awareness of the resources of English prose, and to provide intensive practice in using these. Prerequisite: ANGL 215 and consent of the Dean.

NOTE: Prérequis pour les cours qui suivent: Anglais 200 ou 210 ou 2 demi-cours au niveau 200.

ANGL 305. (Education) *The Development of Children's Literature.* ★3 (single term, 3-0-0). A study of the history of children's literature, with works of representative writers. Note: Formerly part of English 398.

ANGL 306. (Education) *Folklore in Children's Literature.* ★3 (single term, 3-0-0). A study of myths, folk-tales, legends and other oral materials drawn into English literature from a variety of cultural traditions. Note: Formerly part of English 398.

ANGL 359. *American Fiction to 1900.* ★3 (First Term, 3-0-0). Representative works. Note: Not to be taken by students with credit in ENGL 373.

ANGL 360. *The Modern American Novel.* ★3 (Second Term, 3-0-0). Representative works of Twentieth Century American novelists. Note: Not to be taken by students with credit in ENGL 383.

174.4 Anthropologie / Anthropology

ANTHE 202. *L'homme et la culture.* ★6 (3-0-0). Introduction à une pensée anthropologique sur des sujets tels que la race l'évolution, la croissance de la culture et les changements de culture.

ANTHE 307. *Introduction à l'anthropologie sociale et culturelle* ★3 (demi-cours, 3-0-0). Etude comparative de la société et de la culture de l'homme, en particulier dans les communautés non-occidentales, en insistant sur la famille, la structure sociale, l'économie, les institutions politiques et la religion; les procédures de changement.

ANTHE 308. *Introduction à l'anthropologie linguistique.* ★3 (demi-cours, 3-0-0). Etude anthropologique du langage et de la communication. Aperçu rapide des méthodes d'enquête sur le terrain et des méthodes analytiques, et théorie de l'anthropologie linguistique.

ANTHE 325. *Anthropologie et problèmes mondiaux.* ★6 (3-0-0) Approche anthropologique de la culture capitaliste, de la structure sociale des rapports colonialistes et néo-colonialistes, et la naissance de nouvelles sociétés. Prérequis: un cours d'introduction en anthropologie ou en sociologie.

ANTHE 403. *Culture et langage.* ★6 (3-0-0). L'anthropologie de la communication. Les inter-relations entre les "modes" de langage, la pensée et le comportement dans les société occidentales.

ANTHE 418. *Anthropologie politique.* ★3 (demi-cours, 3-0-0) Introduction à l'anthropologie politique moderne, l'accent étant mis sur la description et l'analyse ethnographiques des problèmes de pluralisme, de stratification et de mobilisation des masses rurales. Note: faisait partie de Anthropologie 412. Prérequis: ANTHE 417 ou l'accord du Doyen.

ANTHE 420. *Anthropologie de la religion.* ★6 (3-0-0). Croyances et pratiques surnaturelles dans les cultures primitives et paysannes, incluant la magie, le chamanisme, la prêtrise, les tabous et croyances populaires. Théories évolutionnistes historiques et fonctionnelles de la religion. Prérequis: un cours en anthropologie ou en sociologie ou l'accord du Doyen.

174.5 Art Dramatique / Drama

ADRAM 200. *Analyse de l'art dramatique.* ★6 (0-4L-0). Analyse critique de pièces choisies et son application dans la recherche de solutions créatrices concernant leurs réalisation. Analyse des activités artistiques complémentaires dans le cadre du théatre: la composition du texte, le jeu des acteur le décor et la mise-en-scène.

ADRAM 243. *Amélioration de la voix et de la diction.* ★3 (demi-cours, 0-6L-0). Exercises pour améliorer la voix et diction; introduction à la communication orale. Note: faisa partie de ADRAM 241.

ADRAM 251. *Improvisation.* ★3 (1er semestre, 0-6L-0). L'improvisation dans l'exercice de la parole et des mouvements avec l'accent mis sur le développement de l'imagination: l'introduction à la forme théatrale et à la création gestuelle en particulier.

ADRAM 253. *Art dramatique improvisé.* ★3 (demi-cours, 0-6L-0). Développement de la création gestuelle par des techniques d'improvisation déterminées par le milieu. Note: Antérieurement ADRAM 252. Prérequis: ADRAM 251 ou l'accord du doyen.

ADRAM 321. *Créativité et Théâtre pour Jeunes.* ★3. (2ième semestre, 1-3L-0). Approche pratique et théorique au développement des ressources humaines par l'art dramatique: improvisation en ce qui a trait au théâtre pour jeunes. Prérequis: ADRAM 251, 253 ou l'accord du doyen.

ADRAM 343. *Communication orale.* ★3 (demi-cours, 0-4L-0). Techniques variées de communication orale. Note: faisait partie de ADRAM 241. Prérequis: ADRAM 243 ou l'accord du Doyen.

174.6 Biologie/Biology

BIOLE 130. *Introduction à la biologie.* ★6 (3-0-3). Note: ne peut être pris par les étudiants qui ont des crédits pour Biologie 30.

BIOLE 210. *Biologie et le monde moderne.* ★3 (2ième semestre, 3-0-3). Base biologique de l'écologie: origines de l'homme, son évolution; particularités des populations croissantes; place de l'homme et l'influence de la biosphère; projection concernant le futur de l'homme. Pas de pré-requis.

BIOLE 296. *Evolutionary Biology.* ★3 (First Term, 3-0-3). The numbers and kinds of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: Biology 30.

BIOLE 297. *Heredity.* ★3 (Second Term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30.

BIOLE 299. *Fonction biologique.* ★3 (demi-cours, 3-0-3). Physiologie comparée des plantes et animaux supérieurs comprenant la nutrition, les échanges gazeux, la circulation, les relations ioniques et osmotiques et les systèmes de contrôle. Prérequis: Biology 30.

BIOLE 301. *Biologie cellulaire.* ★3 (demi-cours, 3-0-0). Ultrastructure et métabolisme des cellules. Energie dans les systèmes biologiques; protosynthèse; respiration cellulaire; contractilité; croissance et duplication des cellules. Prérequis: BIOLE 297. Prérequis ou co-requis: CHIM 250 ou 350. On recommande aussi de prendre BIOLE 299 avant BIOLE 301.

174.7 Canadien-Français/ French-Canadian

CA FR 220. *Langue parlée et langue écrite: Niveau I.* ★3 (1er semestre, 3-0-2). Cours intensif de français oral et écrit destiné particulièrement aux étudiants francophones (ou étudiants anglophones de compétence égale). Prérequis: French 30 ou 31 et affectation par examen de classement.

CA FR 221. *Atelier de français.* ★0 (4-0-0). Atelier intensif pour étudiants inscrits au CA FR 220 et qui démontrent certaines lacunes linguistiques d'après les résultats de l'examen de classement.

CA FR 222. *Langue parlée et langue écrite: Niveau II.* ★3 (2e semestre, 5-0-0). Continuation de CA FR 220. Prérequis: CA FR 220 ou affectation par examen de classement.

CA FR 320. *Civilisation canadienne-française I.* ★3 (1er semestre, 3-0-0). La civilisation et la culture du Canada français des origines à la Confédération. Cours obligatoire pour l'obtention du diplôme de la Faculté. Prérequis: FRANC 222, CA FR 222 ou l'equivalent (FRANC 205 avant 1978-79.)

CA FR 322. *Civilisation canadienne-française II.* ★3 (2ième semestre, 3-0-0). La civilisation du Canada français de la Confédération à nos jours. Cours obligatoire pour l'obtention du diplôme de la Faculté. Prérequis: CA FR 320.

CA FR 420. *Analyse grammaticale.* ★3 (1er semestre, 3-0-0). Cours intensif avancé d'analyse grammaticale. Théorie et travaux pratiques. Prérequis: Accord du Doyen.

CA FR 421. *Stylistique comparée du français et de l'anglais: I.* ★3 (1er semestre, 3-0-0). Comparaison des moyens d'expression du français et de l'anglais. Etude des calques, des anglicismes, des faux-amis, et des canadianismes. Théorie et pratique de la traduction. Travaux pratiques. Prérequis: Accord du Doyen.

CA FR 422. *Stylistique comparée du français et de l'anglais: II.* ★3 (2e semestre, 3-0-0). Continuation du CA FR 421. Prérequis: CA FR 421.

CA FR 424. *Littérature canadienne-française hors du Québec.* ★3 (demi-cours, 3-0-0). L'étude de l'expression littéraire canadienne-française hors du Québec. Prérequis: Un cours de littérature canadienne-française.

CA FR 425. *Critique littéraire et sociale du Québec.* ★3 (demi-cours, 3-0-0). L'étude des relations entre la pensée politique et la conception de l'art littéraire. L'analyse des problèmes de dualisme, de l'unité et de l'indépendance. Prérequis: Un cours de littérature canadienne-française.

CA FR 450. *Introduction à la littérature canadienne-française du 19ième siècle.* ★3 (demi-cours, 3-0-0). Le roman et la poésie considérés sous l'angle des thèmes dominants. Prérequis: FRANC 325 ou FRANC 326 ou l'équivalent.

CA FR 451. *Le roman canadien-français du 19ième siècle.* ★3 (1er semestre, 3-0-0). Le roman canadien-français depuis la génération de 1890 jusqu'à la naissance du nouveau roman, vu à travers les plus grands romanciers de cette période. Prérequis: FRANC 325 ou FRANC 326 ou l'équivalent.

CA FR 465. *La poésie canadienne-française du 20ième siècle.* ★3 (2e semestre, 3-0-0). Les thèmes majeurs de la poésie canadienne-française de Saint-Denys Garneau à Raoul Duguay. Prérequis: FRANC 325 ou FRANC 326 ou l'équivalent.

CA FR 466. *Le théâtre canadien-français du 20ième siècle.* ★3 (demi-cours, 3-0-0). L'évolution du théâtre canadien-français de Gratien Gélinas à Michel Tremblay. Prérequis: FRANC 325 ou FRANC 326 ou l'équivalent.

CA FR 499. *Études dirigées.* ★3 (demi-cours, 3-0-0). Cours destiné à permettre aux étudiants d'approfondir un sujet de leur choix en littérature canadienne-française. Prérequis: Accord du Doyen.

174.8 Chimie/Chemistry

CHIM 100. *Introduction à la chimie générale.* ★6 (3-0-3). Cours d'initiation. Sujets traités à l'Ecole Secondaire mais étudiés plus en profondeur. Les étudiants qui ont des crédits du Grade XII en Chimie 30 ne peuvent prendre ce cours.

CHIM 200. *Introduction à la Chimie, niveau universitaire.* ★6 (3-1s-3). Eléments de la liaison et de la structure; équilibre chimique et phasé; chimie de solution; thermo-chimie, électrochimie et cinétique chimique, en relations avec la chimie inorganique. Prérequis: CHIM 100, ou Chimie 30 ou l'équivalent.

CHIM 202. *Introduction à la Chimie, niveau universitaire.* ★6 (3-1s-3). Semblables à CHIM 200 mais conçu pour les étudiants qui suivent, ou ont suivi, un cours de mathématiques au niveau universitaire. Prérequis: CHIM 100, ou Chimie 30, ou l'équivalent. Corequis ou prérequis: MATHQ 202 ou 203 ou l'équivalent.

CHIM 250. *Chimie organique.* ★6 (3-0-3). Etude de composés organiques et leur structure moléculaire, et la stéréo-chimie, de façon à ce que quelques molécules importantes en biologie (amino-acides, protéines, médicaments, pesticides, corps gras, sucres, hydrates de carbone, acides nucléiques) aussi bien que les molécules de tous les jours (savons, détergents, fibres, parfums, polymères, etc.) puissent être discutés. Prérequis: CHIM 100 ou Chimie 30 ou un équivalent. Note: Les étudiants qui ont des crédits en CHIM 200 ou 202 devront normalement suivre CHIM 350 et non CHIM 250.

CHIM 302. *Chimie générale.* ★6 (3-1s-3). L'introduction à la chimie générale pour les étudiants qui ont déjà suivi le cours d'introduction à la chimie organique. Les modes de liaison et structure; les équilibres chimiques et équilibres de phases; la chimie des solutions; la thermochimie; l'électrochimie et la

cinétique chimique avec des exemples choisis dans la chimie organique (systèmes d'importance biologiques et de la chimie y inclus). Prérequis: Chimie 30 (ou CHIM 100) et CHIM 250. Recommandé comme prérequis ou corequis: MATHQ 202 ou 203 et 204 (spécialement pour ceux qui envisagent de poursuivre leurs études en chimie). Note: Le cours CHIM 250 est considéré un prérequis tandis que les cours CHIM 200, CHIM 202 ne représentent pas de prérequis suffisants.

CHIM 350. *Chimie organique.* ★6 (3-0-3). Introduction à l'étude des composés du carbone. Prérequis: CHIM 200 ou 202. Note: Les étudiants qui ont des crédits en CHIM 250 ne peuvent suivre ce cours.

174.9 *Curriculum et Méthodologie / Education— Curriculum and Instruction*

CU ME 201. *Introduction à l'éducation physique à l'école élémentaire I.* ★3 (1er semestre, 0-6L-0). (Note: précédemment SEDPH 201).

CU ME 212. *La méthodologie de l'enseignement des études sociales (social studies) au niveau élémentaire.* ★3 (1er semestre, 3-0-0).

CU ME 216. *Mathématiques au niveau élémentaire.* ★3 (1er semestre, 0-3L-0).

CU ME 220. *Sciences au niveau élémentaire.* ★3 (2ième semestre, 0-3L-0).

CU ME 236. *La méthodologie de l'enseignement du dessin (art) au niveau des écoles élémentaires.* ★3 (1er semestre, 3-0-2).

CU ME 237. *La méthodologie de l'enseignement de l'éducation physique au niveau élémentaire.* ★3 (3-0-0).

CU ME 239. *La méthodologie de l'enseignement de la musique au niveau des écoles élémentaires.* ★3 (2ième semestre, 3-0-0).

CU ME 308. *Introduction à l'enseignement du français comme langue seconde au niveau élémentaire dans les écoles bilingues / d'immersion* ★3 (2ième semestre, 3-0-0).

CU ME 310. *L'enseignement du français au premier cycle de l'élémentaire.* ★3 (1er semestre, 3-0-0).

CU ME 311. *L'enseignement du français au deuxième cycle de l'élémentaire.* ★3 (2ième semestre, 3-0-0).

CU ME 339. *Enseignement de la musique au niveau élémentaire.* ★3 (demi-cours, 0-3L-0).

CU ME 345. *Littérature aux Petits.* ★3 (3-0-0).

CU ME 356. *Curriculum et Méthodologie de l'Enseignement du français langue comme seconde au niveau secondaire I dans les écoles bilingues / d'immersion.* ★3 (demi- cours, 0-3L-0).

CU ME 358. *L'enseignement du français 1ère langue au niveau secondaire.* ★3 (1er semestre, 4-0-0).

CU ME 359. *L'enseignement de la littérature au niveau secondaire.* ★3 (2ième semestre, 4-0-0).

CU ME 360. *La méthodologie de l'enseignement des études sociales (social studies) au niveau des écoles secondaires I.* ★3 (1er semestre, 3-0-0). Prérequis: trois cours complets dans la spécialisation.

CU ME 361. *Curriculum et Méthodologie de l'Enseignement des Sciences Sociales au niveau secondaire II.* ★3 (2ième semestre, 3-0-0). Prérequis: CU ME 360 ou consentement du Doyen.

CU ME 368. *Introduction à l'Enseignement des Sciences au niveau secondaire I.* ★3 (1er semestre, 0-3L-0).

CU ME 387. *La méthodologie de l'enseignement de la musique au niveau des écoles secondaires I.* ★3 (demi-cours, 3-0-0). Prérequis ou corequis: trois cours complets dans la spécialisation.

CU ME 388. *La méthodologie de l'enseignement de la musique au niveau des écoles secondaires II.* ★3 (demi-cours, 3-0-0). Prérequis ou corequis: trois cours complets dans la spécialisation et CU ME 387.

CU ME 389. *La méthodologie de l'enseignement de l'art dramatique au niveau des écoles secondaires.* ★3 (demi-cours, 3-0-0). Prérequis ou corequis: trois cours complets dans la spécialisation.

CU ME 404. *Méthodologie de l'enseignement aux tout-petits.* ★6 (3-0-3; 3-0-0). Réservé aux étudiants "senior" qui se spécialisent dans l'enseignement aux tout-petits. Note: auparavant CU ME 426.

CU ME 410. *L'enseignement de la littérature aux petits.* ★3 (demi-cours, 3-0-0).

CU ME 411. *L'enseignement de la littérature aux enfants de 9 à 12 ans.* ★3 (demi-cours, 3-0-0). Pre-requis: CU ME 410.

CU ME 412. *Sciences humaines à l'élémentaire.* ★3 (3-0-0). Prérequis: CU ME 212 ou l'équivalent. Note: anciennement ED CI 405.

CU ME 451. *Enrichissement du français parlé au niveau de la maternelle.* ★3 (demi-cours, 3-0-0).

CU ME 458. *Nouvelles façons d'aborder l'enseignement de la langue seconde.* ★3 (demi-cours, 0-3L-0).

CU ME 462. *Changements apportés au programme des Etudes Sociales au niveau des écoles secondaires.* ★3 (3-0-0). Note: Prérequis: CU ME 360/361 ou 460/461 ou avec le consentement du Département.

CU ME 499. *Etude personnelle dirigée dans le domaine de l'enseignement secondaire.* ★3 (l'un ou l'autre semestre, 3-0-0). Prérequis: accord du professeur et du Doyen.

174.10 *Economie / Economics*

ECONE 201. *Introduction à la micro-économie.* ★3 (1er semestre, 3-0-0). Analyse économique, problèmes et politiques, avec l'accent sur l'économie canadienne; le rôle des consommateurs et des compagnies dans les marchés à compétition et à monopole; le capital étranger dans l'économie canadienne; distribution des revenus, inégalité et pauvreté; utilisation du milieu; politiques économiques gouvernementales. Prérequis: Mathématiques 20 ou 33 ou l'accord du Doyen.

ECONE 202. *Introduction à la macro-économie.* ★3 (2ième semestre, 3-0-0). Analyses, problèmes et politiques économiques avec l'accent sur l'économie canadienne: revenu national et théorie monétaire; problèmes du chômage et de l'inflation; politiques gouvernementales monétaires et fiscales: théorie du commerce international, problèmes et politiques gouvernementales. Prérequis: Mathématiques 20 ou Mathématiques 33 ou l'accord du Doyen.

ECONE 316. *L'économie canadienne, I.* ★3 (demi-cours, 3-0-0). Vue d'ensemble du développement économique du Canada, avec l'accent sur les exportations régulières, la formation du capital, les politiques gouvernementales et les disparités régionales qui ont caractérisé le 19ième siècle au Canada.

ECONE 317. *L'économie canadienne, II.* ★3 (demi-cours, 3-0-0). Vue d'ensemble du développement économique du Canada au 20ième siècle. L'étude de l'immigration, les investissements étrangers, les effets économiques des deux guerres mondiales, l'exploitation des ressources naturelles et la naissance de régions économiques distinctes au Canada. Prérequis: ECONE 316 ou l'accord du Doyen.

174.11 *Education Physique / Physical Education*

EDPHQ 400. *Problèmes contemporains.* ★3 (3-0-0). Analyse intraculturelle des problèmes posés par l'éducation physique dans une perspective d'éducation bilingue.

174.12 *Formation à l'enseignement / Education Practicum*

EN PRQ 200. *Introduction à l'Enseignement élémentaire.* ★3 (3-0-0). (Ex CU ME 200).

EN PRQ 201. *Enseignement pratique: Niveau élémentaire.* ★3.

EN PRQ 202. *Enseignement pratique: Niveau élémentaire.* ★3.

ENPRQ 203. *Enseignement pratique: Niveau élémentaire.* ★3.

ENPRQ 204. *Enseignement pratique: Niveau élémentaire.* ★3.

ENPRQ 205. *Enseignement pratique: Niveau élémentaire.* ★3.

ENPRQ 209. *Etude approfondie individuelle de compétences particulières dans l'enseignement au niveau élémentaire.* ★3.

EN PRQ 251. *Introduction à l'Ecole secondaire.* ★3.

EN PRQ 252. *Enseignement pratique: Niveau secondaire.* ★3.

ENPRQ 253. *Enseignement pratique: Niveau secondaire.* ★3.

ENPRQ 254. *Enseignement pratique: Niveau secondaire.* ★3.
ENPRQ 255. *Enseignement pratique: Niveau secondaire.* ★3.
ENPRQ 256. *Enseignement pratique: Niveau secondaire.* ★3.
ENPRQ 259. *Etude approfondie individuelle de compétences particulières dans l'enseignement au niveau secondaire.* ★3.

174.13 Entomologie / Entomology

ENTIE 209. *Entomology for Non-Biologists.* ★3 (First Term, 3-0-3). Comparisons of the structure, relationships, behavior and place in nature of insects and man. No prerequisite.

174.14 Etudes Religieuses / Religious Studies

ET RE 348. *La tradition chrétienne.* ★3 (2ième semestre, 3-0-0). Les thèmes classiques de la chrétienté depuis le Nouveau Testament jusqu'à nos jours: le message de Jésus-Christ, le kerygme, la hiérarchie de l'église, l'évolution de la doctrine, le canon des Saintes Ecritures, l'Eglise et l'Etat, les Saintes Ecritures et leur interprétation. Précédemment ET RE 364.

ET RE 354. *L'évangile de Marc.* ★3 (3-0-0).

ET RE 360. *La notion de Dieu.* ★6 (3-0-0). L'étude de l'idée que les grandes religions se sont faites de Dieu.

ET RE 361. *Symbolisme religieux.* ★3 (Premier semestre, 3-0-0). Etude comparative de symboles religieux dans les différentes religions du monde: primitives, classiques et modernes. Une attention particulière sera accordée aux différentes approches et méthodes.

ET RE 363. *Les fondateurs des religions.* ★3 (1er semestre, 3-0-0). Une étude de la vie des fondateurs des religions: Abraham, Bouddha, Jésus-Christ et Mohammed; et comment leur vie a donné un sens à la vie et aux dévotions des croyants à travers l'histoire. L'accent sera mis sur les livres hagiographiques et religieux concernant la naissance, les miracles et la vie des fondateurs.

ET RE 370. *La pensée religieuse de l'époque moderne et la pensée athée.* ★6 (3-0-0). L'étude de l'histoire de la pensée religieuse depuis le siècle des lumières jusqu'à nos jours. En particulier, l'apparition et le cheminement de l'athéisme moderne.

174.15 Fondements de l'Education / Educational Foundations

FO ED 201. *Introduction à l'histoire canadienne de l'éducation.* ★3 (2ième semestre, 3-0-0).

FO ED 401. *Choix de sujets en fondements de l'éducation.* ★3 (demi-cours, 3-0-0). Prérequis: Accord du Doyen.

FO ED 430. *Histoire de l'Education dans l'Ouest.* ★3 (1er semestre, 3-0-0). (Ancien FO ED 351.)

FO ED 452. *Approche philosophique de l'éducation et des théories du savoir.* ★3 (2ième semestre, 3-0-0). (Ancien FO ED 447.)

174.16 Français / French

FRANC 220. *Cours de français: Niveau I.* ★3 (1er semestre, 3-0-2). Un cours intensif en français oral, où l'accent est mis sur l'expression orale "contrôlée". Le cours inclut une revue de structures grammaticales de base et la lecture de textes. Prérequis: French 30 ou 31 et affectation par examen de classement.

FRANC 221. *Atelier de français: Niveau I.* ★0 (1er semestre, 2-0-2). Atelier intensif pour étudiants inscrits au Franc 220 et qui démontrent certaines lacunes linguistiques d'après les résultats de l'examen de classement.

FRANC 222. *Cours de français: Niveau II.* ★3 (2ième semestre, 3-0-2). Un cours intensif en français oral, où l'accent est mis sur l'expression orale "libre". Le cours inclut le travail de composition, une revue de certaines constructions grammaticales et la lecture de certains textes littéraires. Prérequis: FRANC 220 ou affectation par examen de classement.

FRANC 223. *Atelier de français: Niveau II.* ★0 (2ième semestre, 4-0-0). Atelier intensif pour étudiants inscrits au FRANC 222 et qui démontrent certaines lacunes linguistiques d'après l'examen de classement.

FRANC 320. *Composition française: Niveau I.* ★3 (1er semestre, 3-0-0). Cours théorique et pratique. La composition des phrases. Grammaire et enrichissement du vocabulaire. Prérequis: FRANC 222 ou l'équivalent ou affectation par examen de classement.

FRANC 321. *Composition française: Niveau II.* ★3 (2ième semestre, 3-0-0). Cours théorique et pratique. Etude des formes écrites: la description et la narration. Etudes de textes. Prérequis: FRANC 320 ou l'équivalent.

FRANC 322. *Composition française: Niveau III.* ★3 (les deux semestres, 3-0-0). Formation du style. Etude des méthodes de la dissertation. Cours obligatoire pour l'obtention du diplôme de la Faculté. Prérequis: FRANC 321 ou l'équivalent. Précédemment FRANC 350.

FRANC 324. *Civilisation francophone.* ★3 (3-0-0). Les différents aspects de la civilisation française: l'histoire, les institutions politiques, sociales et économiques; les arts, etc., de la France et des pays d'expression française (non-américains). Prérequis: FRANC 222 ou CA FR 222 ou l'équivalent.

FRANC 325. *Initiation aux études littéraires: I.* ★3 (1er semestre, 3-0-0). La théorie littéraire. L'étude des genres et des figures de style. Les textes à étudier dans le cadre de l'époque classique. Prérequis: FRANC 222 ou CA FR 222 ou l'approbation du professeur.

FRANC 326. *Initiation aux études littéraires: II.* ★3 (2ième semestre, 3-0-0). La théorie littéraire et l'analyse de l'évolution des genres et du styles. Les textes du XVIIIe siècle. Prérequis: FRANC 222 ou CA FR 222 avec l'approbation du professeur.

FRANC 327. *Introduction à la littérature du XIXe siècle.* ★3 (1er semestre, 3-0-0). L'analyse des mouvements littéraires. L'évolution de la conception littéraire à travers les textes du XIXe siècle. Prérequis: FRANC 325 ou FRANC 326 ou CA FR 222 avec l'approbation du professeur.

FRANC 328. *Introduction à la littérature du XXe siècle.* ★3 (2ième semestre, 3-0-0). L'introduction à la littérature moderne. Du surréalisme au nouveau roman, du vaudeville au théâtre de l'absurde et de Bergson à Sartre. Prérequis: FRANC 325 ou FRANC 326 ou CA FR 222 avec l'approbation du professeur.

174.17 Géographie / Geography

GEOGE 230. *Introduction à la géographie physique I.* ★3 (1er semestre, 3-0-2). Introduction à la géomorphologie. Analyse structurale des formes du relief terrestre et étude de leur évolution sous l'influence des conditions morpho-climatiques. Excursion prévue. Travaux pratiques. Ne peut être pris par les étudiants qui ont des crédits en GEOGE 201.

GEOGE 231. *Introduction à la géographie physique II.* ★3 (2ième semestre, 3-0-2). Notions de climatologie et de biogéographie. Les climats, les sols et la végétation; étude de leurs combinaisons en divers milieux bioclimatiques. Travaux pratiques. Ne peut être pris par les étudiants qui ont des crédits en GEOGE 201.

GEOGE 250. *Organisation de l'activité humaine en fonction de l'espace.* ★3 (1er semestre, 3-0-0). Recherche d'un ordre dans l'occupation de la terre par l'homme et dans la distribution humaine sur terre; les cartes vues en tant que techniques pour comprendre la réalité.

GEOGE 251. *Introduction à la géographie culturelle.* ★3 (demi-cours, 3-0-0). Signification de la distribution humaine sur la terre. Les relations de l'homme avec son milieu physique; problèmes de la population mondiale; les différentes cultures à travers le monde.

GEOGE 309. *Géographie physique intermédiaire.* ★6 (3-0-3). Climat, végétation, sol, étendues d'eau et terre ferme; l'accent est mis sur l'étude de types locaux, régionaux et mondiaux. Etude sur le terrain indispensable. Prérequis: GEOGE 230 ou 231 et l'accord du Doyen.

GEOGE 360. *Géographie rurale du Canada.* ★3 (demi-cours, 3-0-0). Le milieu physique et le développement rural du Canada; les limites physiques et les marges économiques: développement agricole et rural; l'avenir rural du Canada.

GEOGE 381. *Géographie de la ville.* ★3 (demi-cours, 3-0-0). Origine et extension de l'urbanisation. Problèmes de la croissance dans les zones urbaines et dans les systèmes interurbains.

GEOGE 382. *Géographie urbaine du Canada.* ★3 (2ième semestre, 3-0-0). L'espace dans le développement urbain du Canada avec une référence particulière à la recherche actuelle.

GEOGE 400. *L'Amérique du Nord.* ★6 (3-0-0). Géographie régionale du Canada et des Etats-Unis. Le cadre physique et son rôle dans leur développement historique. Concept de région géographique; type et caractéristiques avec le choix d'études détaillées. Prérequis: un cours de géographie ou l'accord du Doyen.

GEOGE 414. *L'Afrique.* ★6 (3-0-0). Exploration et caractéristiques physiques et humaines du continent. Influence de l'Asie et de l'Europe sur la population. Changements d'attitudes vis-à-vis de ses ressources. Rapports historiques et économiques avec le reste du monde depuis 1500. Etudes des régions, des problèmes économiques et du potentiel de ressources. Prérequis, un cours de géographie ou l'accord du Doyen.

GEOGE 442. *L'Amérique Centrale.* ★3 (demi-cours, 3-0-0). Géographie historique et régionale du Mexique, des Caraïbes et de l'Amérique Centrale. Problèmes géographiques contemporains de ces régions.

GEOGE 443. *L'Amérique du Sud.* ★3 (demi-cours, 3-0-0). Géographie du continent sud-américain. Notions de géographie physique et de géographie humaine passée et présente. Leur importance en Amérique du Sud aujourd'hui. Etude de quelques problèmes actuels.

GEOGE 449. *L'Ouest Canadien.* ★3 (demi-cours, 3-0-0). Ressources, types de développement et régions de l'Ouest Canadien. Accent sur les régions exploitées des Prairies et de la Colombie Britannique. Note: faisait partie précédemment de GEOGE 406.

GEOGE 452. *Géographie culturelle.* ★3 (demi-cours, 3-0-0). La culture et les problèmes géographiques. Les expériences et traditions humaines et l'utilisation du milieu naturel.

GEOGE 454. *Géographie de la population.* ★3 (demi-cours, 3-0-0). Structures spatiales, caractéristiques démographiques et culturelles. Leur évolution. Répartition, densité, structures internes, mobilité et croissance de la population étudiées en fonction des diverses situations économiques et sociales.

GEOGE 460. *Développement régional.* ★3 (demi-cours, 3-0-0). Définitions du développement régional et des régions défavorisées. Efforts tentés pour y remédier et leurs effets spatiaux. Accent mis sur les régions défavorisées du Canada.

174.18 Géologie/Geology

GEOLE 202. *Géologie physique.* ★3 Premier semestre, (3-0-3). Structure interne et composition de la terre; continents et océans; roches et minéraux; eaux souterraines et approvisionnement en eau, érosion, transport et dépôt de sédiments; activité éruptive et métamorphisme; formation des montagnes; structures tectoniques. Ce cours n'est pas accessible aux étudiants ayant obtenu un crédit en GEOLE 301 ou 390.

GEOLE 203. *Histoire de la terre.* ★3 (Deuxième semestre, 3-0-3). Epoques géologiques; fossiles; évolution des principaux groupes et de l'homme; utiiisation des fossiles en géologie historique; paléogéographie; géologie historique. Ce cours n'est pas accessible aux étudiants ayant obtenu un crédit en GEOLE 302 ou 306. Prérequis: GEOLE 202.

174.19 Histoire/History

HISTE 200. *Histoire de l'Europe.* ★6 (3-1s-0). Enseigné en 1979-80.

HISTE 278. *Introduction à l'étude de l'histoire du Canada de 1500 à 1867.* ★3 (1er semestre, 3-0-0). Conçu comme base pour les cours "senior" et avancés d'histoire du Canada. Note: auparavant HISTE 378.

HISTE 279. *Introduction à l'étude de l'histoire du Canada de 1867 à 1967.* ★3 (2ième semestre, 3-0-0). Conçu comme base pour les cours "senior" et avancés en histoire du Canada. Note: auparavant HISTE 379.

HISTE 310. *L'Europe du 20ième siècle.* ★6 (3-0-0).

HISTE 371. *L'Ouest Canadien jusqu'en 1870.* ★3 (1er semestre, 3-0-0). Un exposé mettant l'accent sur l'histoire des prairies, mais traitant également de l'expansion vers l'ouest et le nord, et le l'ouest ultra-montain. On recommande fortement aux étudiants de suivre HISTE 278/279 avant de s'inscrire à ce cours.

HISTE 372. *L'Ouest canadien depuis 1870.* ★3 (2ième semestre, 3-0-0). On recommande fortement aux étudiants de suivre HISTE 278/279 avant de s'inscrire à ce cours.

HISTE 374. *Le Canada Français jusqu'à la Confédération I.* ★3 (1er semestre, 3-0-0). Prérequis: HISTE 278 ou 279 ou l'accord du Doyen.

HISTE 375. *Le Canada Français depuis la Confédération II.* ★3 (2ième semestre, 3-0-0). Prérequis: HISTE 278 ou 279 ou l'accord du Doyen.

HISTE 376. *Histoire du Canada depuis 1914.* ★3 (1er semestre, 3-0-0).

HISTE 378. *Histoire du Canada à partir de la Confédération jusqu'à la Première Guerre Mondiale.* ★3 (2ième semestre, 3-0-0).

174.20 Lettres Classiques/Classics

LCLSS 202. *La mythologie grecque et romaine.* ★3 (1er semestre, 3-0-0). Un aperçu de la mythologie au moyen de lectures choisies en traduction d'auteurs anciens et d'études contemporaines. (Faisait partie de LCLSS 240.)

LCLSS 250. *Le monde grec.* ★3 (Deuxième semestre, 3-0-0). Vie et société grecques illustrées par des découvertes archéologiques; l'âge de bronze, la cité, les tempies, Athènes, Sparte, l'art et l'architecture grecs, le commerce et la guerre. Diapositives, films et autres documents.

LCLSS 357. *Mythes classiques et Religion.* ★3 (1er semestre, 3-0-0). Fondements et origines des mythes classiques et de la religion; les festivals religieux et coutumes; les humanistes modernes.

LCLSS 359. *Classiques en français (grecs) I.* ★3 (1er semestre, 3-0-0). Littérature grecque étudiée dans le cadre de la civilisation grecque antique; au programme du cours: Homère, Hésiode, la poésie lyrique, Eschyle et Sophocle. Note: auparavant LCLSS 350.

LCLSS 360. *Classiques en français (grecs) II.* ★3 (2ième semestre, 3-0-0). Suite de l'étude de la littérature grecque dans le cadre de la civilisation grecque antique. Au programme: Sophocle, Euripide. Aristophane, les historiens et les philosophes. Note: auparavant LCLSS 350.

LCLSS 361. *Classiques en français (latins) I.* ★3 (demi-cours, 3-0-0). Etude de la littérature de Rome depuis ses débuts jusqu'à l'époque d'Auguste, illustrant de nombreux aspects de la vie romaine. Note: auparavant LCLSS 351.

LCLSS 362. *Classiques en français (latins) II.* ★3 (demi-cours, 3-0-0). Suite de l'étude de la littérature de Rome dans le cadre de la vie romaine; littérature de l'époque d'Auguste et du Bas-Empire. Note: auparavant LCLSS 351.

LCLSS 367. *Histoire de l'art grec I.* ★3 (demi-cours, 3-0-0). Naissance et développement de l'art depuis l'époque crétoise; l'architecture et le début de la sculpture. (Note: auparavant faisait partie de LCLSS 354).

LCLSS 368. *Histoire de l'art grec II.* ★3 (demi-cours, 3-0-0). La sculpture de l'âge classique à l'ère gréco-romaine: Peinture. (Note: auparavant faisait partie de LCLSS 354).

LCLSS 369. *Premières Civilisations I.* ★3 (demi-cours, 3-0-0). Un aperçu des débuts et du développement des civilisations au Proche Orient, incluant Sumer, Babylone, Assyrie et la Judée.

LCLSS 370. *Premières Civilisations II.* ★3 (demi-cours, 3-0-0). Le développment de la civilisation dans la partie ouest de la Mésopotamie, incluant l'origine et le déclin des cultures égyptiennes, hittites et phéniciennes.

LCLSS 483. *La tragédie grecque et romaine I.* ★3 (demi-cours, 3-0-0). Note: Auparavant faisait partie de LCLSS 471.

LCLSS 484. *La tragédie grecque et romaine II.* ★3 (demi-cours, 3-0-0). Note: Auparavant faisait partie de LCLSS 471.

174.21 Linguistique/Linguistics

LINGQ 200. *Introduction à l'étude du langage.* ★3 (1er semestre, 3-0-0). Initiation à l'étude des grands traits du langage: le langage vu comme système de communication et comme procédé psychologique; la structure interne du langage; évolution et variation dans le langage; initiation à la discipline de la linguistique.

174.22 Linguistique Romane/ Romance Linguistics

LIN R 320. *Linguistique française: Phonétique et morphophonologie.* ★3 (1er semestre, 3-0-0). Etude du système phonétique et morphophonologique du français. Comparaison des systèmes phonétiques et phonologiques du français, du français canadien et de l'anglais. Cours restreint aux francophones et aux anglophones de compétence égale. Prérequis: LINGQ 200 ou l'équivalent.

LIN R 321. *Linguistique française: Syntaxe et sémantique.* ★3 (2ième semestre, 3-0-0). Etude du système morphologique, syntaxique et sémantique du français. Cours restreint aux francophones et aux anglophones de compétence égale. Prérequis: LINGQ 200 ou l'équivalent.

174.23 Mathématiques/Mathematics

MATHQ 202. *Calcul élémentaire I.* ★3 (1er semestre, 3-0-0). Revue de la géométrie analytique, différenciation et intégration des fonctions simples, applications. Prérequis: Mathématiques 30 ou un équivalent. Note: Les étudiants n'ayant pas de connaissance en trigonométrie doivent conjointement suivre MATHQ 101.

MATHQ 204. *Calcul élémentaire II.* ★3 (2ième semestre, 3-0-0). Différenciation et intégration des fonctions trigonométriques, exponentielles et logarithmiques. Formes indéterminées et intégrales généralisées. Techniques d'intégration. Applications. Prérequis: MATHQ 202, 203, 245 ou un équivalent.

MATHQ 221. *Algèbre linéaire I.* ★3 (1er semestre, 3-0-0). Résolution d'équations linéaires, algèbre matricielle, déterminantes, espace n, programmation linéaire. Prérequis: Mathématiques 30 ou l'équivalent. Remarque: ce cours ne peut être pris en vue d'un crédit si un crédit a déjà été obtenu dans l'un des cours suivants: MATH 243, 274, 278, 281 ou 312.

MATHQ 222. *Algèbre linéaire II.* ★3 (2ième semestre, 3-0-0). Bases, transformations linéaires, changement des bases, vecteurs fondamentaux, processus de Markov. Prérequis: MATH 221, 278 ou l'équivalent. Remarque: ce cours ne peut être pris en vue d'un crédit si un crédit a déjà été obtenu en MATH 378 ou MATH 381.

MATHQ 302. *Intermediate Calculus I.* ★3 (single term, 4-0-0). Vectors in space geometry, determinants, Cramer's rule, complex numbers, partial differentiation, multiple integration. Prerequisite: MATH 204 or equivalent.

MATHQ 303. *Intermediate Calculus II.* ★3 (single term, 4-0-0). Infinite series, elements of linear differential equations, curves and tangent vectors, polar cylindrical and spherical coordinates, arc length and surface area. Prerequisite: MATH 302 or equivalent.

174.24 Microbiologie/Microbiology

MICRE 201. *Elementary Microbiology.* ★3 (single term, 3-0-3). An introduction to the microbial world, with emphasis on general characteristics of bacterial growth and fundamentals of classification. Note: Offered to students in Agriculture and Foreatry and Home Economics, and as a Natural Science option to students in Arts. Not available to students in Science.

174.25 Musique/Music

MUSIQ 200. *Les rudiments de la musique.* ★3 (1er semestre, 3-0-0). Une étude de l'écriture musicale y compris la notation, les gammes, les clés, les armures, les intervales, les accords, les mesures et le rythme. Audition de matériel. Composition de mélodie avec ou sans mots en clés majeures ou mineures. Note: Les étudiants en B.Mus. ne peuvent pas prendre ce cours pour crédit.

MUSIQ 203. *Histoire de la musique baroque.* ★3 (2ième semestre, 3-0-0). Note: ouvert aux étudiants préparant un B. Musique, les autres doivent avoir comme prérequis MUSIQ 200 ou l'équivalent, mesurable par un examen de placement en théorie musicale.

MUSIQ 206. *Introduction à la musique I.* ★3 (1er semestre, 3-0-0). Définition des termes; formes et styles musicaux du Baroque au Classique. Audition d'exemples enregistrés. Note: Ce cours sera enseigné en anglais pendant une période ne dépassant pas un (1) mois, au premier semestre.

MUSIQ 207. *Introduction à la musique II.* ★3 (2ième semestre, 3-0-0). Des Romantiques à nos jours. Introduction au répertoire de concerts. Note: Ouvert aux étudiants non éligibles à MUSIQ 202, 203, 301, 304, ou 402.

MUSIQ 229. *Ensemble.* ★3 (0-2L-0). Pour les étudiants non inscrits au B.MUS. Prérequis: L'accord de l'instructeur. Note: demi-cours qui s'étale sur toute l'année. Note: Offert en 1980-81.

MUSIQ 250. *Harmonie élémentaire.* ★3 (demi-cours, 0-3L-0). Harmonie diatonique, y compris les septièmes secondaires. Modulation. Emploi des notes non-harmoniques de toutes sortes. Harmonisation de chorales dans le Style de Bach. Prérequis: MUSIQ 200 ou l'équivalent, mesurable par un examen de placement en théorie musicale. Note: demi-cours qui s'étale sur toute l'année.

MUSIQ 251. *Culture élémentaire de l'oreille.* ★3 (0-3L-0). Perception auditive des matières couvertes en MUSIQ 250. Co-requis: MUSIQ 250. Note: demi-cours qui s'étale sur toute l'année.

MUSIQ 301. *Histoire de la musique classique et romantique.* ★3 (demi-cours, 3-0-0). Note: destiné aux étudiants en B.Mus. Les autres doivent avoir comme prérequis MUSIQ 200 ou l'équivalent mesurable par un examen de placement en théorie musicale.

MUSIQ 304. *Histoire de la musique romantique et post-romantique.* ★3 (demi-cours, 3-0-0). Note: ouvert aux étudiants préparant un B.MUS., les autres doivent avoir comme prérequis MUSIQ 200 ou l'équivalent, mesurable par un examen de placement en théorie musicale.

MUSIQ 305. *Littérature musicale pour les enfants.* ★3 (demi-cours, 3-0-0). Vue d'ensemble, sélection et utilisation d'enregistrements, de films, de films fixes et de livres sur la musique et les musiciens. Prérequis: CU ME 239 ou l'équivalent.

MUSIQ 329. *Ensemble.* ★3 (0-2L-0). Note: Demi-cours qui s'étale sur toute l'année. Prérequis: l'accord de l'instructeur. Note: Offert en 1980-81.

MUSIQ 429. *Ensemble.* ★3 (0-2L-0). Note: Demi-cours qui s'étale sur toute l'année. Prérequis: L'accord de l'instructeur. Note: Offert en 1980-81.

174.26 Philosophie/Philosophy

PHILE 221. *Logique pratique.* ★3 (demi-cours, 3-0-0). Les procédés et les principes selon lesquels on distingue une argumentation correcte d'une argumentation fautive. La matière du cours pourra inclure les sophismes informels, l'initiation à la méthode élémentaire, les procédés susceptibles de mener à une décision rationnelle et l'analyse des arguments.

PHILE 240. *Introduction à la Philosophie occidentale.* ★6 (3-0-0). Une introduction aux théories et aux problèmes principaux qui ont dominé la pensée philosophique du monde occidental par une étude et discussion de textes classiques choisis. L'accent sera mis sur la connaissance du fond de la matière avec les données principales de notre tradition philosophique, ainsi que sur l'habilité à soutenir des idées philosophiques de façon indépendante. Note: Ce cours sera

enseigné en anglais pendant une période ne dépassant pas un (1) mois, au premier semestre.

NOTE: A MOINS D'INDICATION CONTRAIRE, IL N'Y A PAS DE PREREQUIS FORMELS POUR LES COURS AU NIVEAU 300. Toutefois, les étudiants désirant s'inscrire à ces cours trouveront qu'il est très avantageux d'avoir d'abord suivi un cours de philosophie, tel le 230, le 239 ou le 240.

PHILE 322. *Epistémologie.* ★3 (1er semestre, 3-0-0). Introduction aux questions visant la connaissance, surtout en ce qui concerne ses sources et sa justification. Ce cours comporte des sujets de discussion, tels le scepticisme et la certitude; la vérité, la foi ou la croyance et la justification; la connaissance du monde extérieur; la perception, la pensée et la mémoire; la connaissance *a priori* et empirique.

PHILE 323. *Philosophie de l'esprit.* ★3 (2ième semestre, 3-0-0). Approches de la question de ce qu'est être une personne et posséder un esprit. On étudiera le rapport entre les idées philosophiques et les examens scientifiques des phénomènes mentaux. Parmi les sujets propres au cours: identité personnelle, mémoire, imagination, intention, désir, émotion et sensation, rapport entre le corps et l'esprit.

PHILE 326. *Philosophie contemporaine de l'Europe continentale I.* ★3 (demi-cours, 3-0-0). Introduction à une ou à plusieurs orientations philosophiques récentes en Europe continentale. On étudiera des philosophes, tels Husserl, Heidegger, Sartre et Merleau-Ponty; et des orientations, telles l'existentialisme, la phénoménologie, l'herméneutique, le structuralisme et le marxisme.

PHILE 327. *Philosophie contemporaine de l'Europe continentale II.* ★3 (demi-cours, 3-0-0). Une étude plus détaillée des orientations présentées en PHILE 326 et/ou introduction à certains aspects de la philosophie récente de l'Europe continentale qui n'ont pas été abordés en PHILE 326. Prérequis: PHILE 326 ou permission du Doyen.

PHILE 339. *Philosophie Ethique I.* ★3 (3-0-0). L'étude de la théorie éthique dans les textes de Platon, Aristote, Hobbs, Hume, et Kant; les questions du bien et du mal, du faux et du vrai et l'examen des raisons de l'action. Une attention spéciale à consacrer aux problèmes de la morale contemporaine. Auparavant faisait partie de PHILE 354.

PHILE 340. *Philosophie Ethique II.* ★3 (3-0-0). J.S. Mill et l'utilitarisme. Les critiques récentes de l'éthique utilitariste; l'évolution du relativisme et du scepticisme dans la pensée éthique; les théories de la liberté, de la responsabilité et du châtiment. Auparavant faisait partie de PHILE 354.

PHILE 349. *Esthétique: Philosophie des Arts.* ★3 (demi-cours, 3-0-0). Introduction aux théories traditionnelles, p.e. la théorie de l'expressionniste et du formaliste qui étudie la nature et la fonction des Arts. On examinera la nature de l'expérience esthétique. Note: faisait partie de PHILE 350.

PHILE 350. *Esthétique: Philosophie du Critique.* ★3 (demi-cours, 3-0-0). Introduction aux fondements de l'art de la critique. Une attention spéciale sera donnée aux questions concernant les niveaux d'interprétation et d'évaluation des arts.

PHILE 357. *Philosophie de la Religion I.* ★3 (1er semestre, 3-0-0). Sujets généraux dans la philosophie de la religion; on choisira parmi les sujets suivants: le concept de "religion"; rapports entre philosophie et religion; arguments pour et contre l'existence de Dieu; sens et intelligibilité dans le langage religieux; religion et moralité; la religion et "le sens de la vie"; portée de l'étude de la religion sur les Sciences Sociales. Note: faisait précédemment partie de PHILE 358.

PHILE 358. *Philosophie de la Religion II.* ★3 (2ième semestre, 3-0-0). Etude approfondie des concepts et des problèmes particuliers à la religion, tels que "Dieu" (dans les différentes religions), l'incarnation, le miracle, la prière, la vie après la mort, l'expérience religieuse, la transcendance, le problème du mal. Prérequis: PHILE 357 ou l'accord du Doyen.

PHILE 364. *Introduction à la Philosophie des Sciences I.* ★3 (1er semestre, 3-0-0). Ce cours est conçu pour donner une vue d'ensemble des fondements de la connaissance scientifique, par l'explication des méthodes et des hypothèses de base qui se sont développées en science à travers les siècles.

PHILE 365. *Philosophie des sciences sociales.* ★3 (2ième semestre, 3-0-0). Un examen critique des théories au sujet de l'homme et de la société qui sont à la base des diverses sciences de l'homme et une évaluation des méthodes propres à ces disciplines.

PHILE 471. *Lecture dirigée I.* ★3 (1er semestre, 3-0-0). Offert uniquement aux étudiants en B.A. Honneurs ou B.A. Spécial.

PHILE 473. *Lecture dirigée II.* ★3 (2ième semestre, 3-0-0). Offert uniquement aux étudiants en B.A. Honneurs ou B.A. Spécial.

174.27 Physiques/Physics

Les cour suivants sont réservés aux étudiants inscrits aux programmes suivants: Arts, Education, Sciences biologiques, Sciences médicales, B.Sc. général.

PHYSQ 212. *Principes généraux de physique.* ★6 (3-0-3). Physique 212 est un cours orienté vers les sciences physiques et emploie un minimum de calcul. Programme: Mécanique, thermodynamique, électromagnétisme et propriétés optiques de la matière; nature et transformations de l'énergie; introduction aux théories atomiques de la physique moderne. Prérequis: *Physiques 30;* Mathématiques 30. Note: *PHYSQ 212 est un cours complet* en lui-même ou peut *être suivi par PHYSQ 301-401.*

PHYSQ 301. *Aspects quantiques de la physique moderne.* ★3 (1er semestre, 3-0-3/2). Evidence expérimentale menant au développement de la mécanique quantique, comprenant l'effet photoélectrique, l'effet Compton, production de rayons X et la diffraction des électrons. Une discussion du principe d'incertitude de Heisenberg et la théorie de la mécanique quantique de Schroedinger en incluant les puits de potentiel en une dimension et les barrières de potentiel, l'effet tunnel et l'oscillateur en mouvement harmonique simple. Prérequis: Un cours de physique de première année (deux semestres); MATHQ 204.

PHYSQ 401. *Physique nucléaire et particules élémentaires.* ★3 (2ième semestre, 3-0-3/2). Sujets traités vont inclure les propriétés et la structure du noyau; la radioactivité, datation à partir du carbone, technique du tracteur; la fission et fusion nucléaires; les réacteurs nucléaires; les particules fondamentales et les accélérateurs de particules. Prérequis: PHYSQ 301.

Les cours suivants sont réservés aux étudiants inscrits au programme B.Sc. (Honors ou Spécialisation).

PHYSQ 242. *Mécanique, électricité et magnétisme.* ★6 (3-1s-3). Cinématique; dynamique d'une particule; travail et énergie; quantité de mouvement; gravitation; mouvement périodique; charge; champ électrique; loi de Gauss; potentiel électrique; capacité électrique; courant et résistance; forces électromotives et courants continus; champs magnétiques; loi d'Ampère; loi de Faraday; inductance. Prérequis: Phys 30, Math 30. Corequis: Math 202(203)/204.

PHYSQ 340. *La chaleur, l'électricité et le magnétisme.* ★6 (3-0-3). Le cours suit PHYSQ 240 et veut donner à l'étudiant un fondement en physique qui lui permettra de poursuivre ses études dans les autres sciences physiques. L'électrostatique, le potentiel électrique, la capacité électrique, les circuits à courant continu, le magnétisme et le champ magnétique, l'électromagnétisme, l'induction magnétique, self-inductance, introduction au courant alternatif, la physique atomique et nucléaire élémentaire; la chaleur et la thermodynamique. Prérequis: PHYSQ 240. Corequis: MATH 302/303 ou 307/308.

174.28 Psychologie/Psychology

PSYCE 260. (Science) *Procédés psychologiques de base.* ★3 (1er semestre, 3-0-0). Principes et développement de la perception, motivation, apprentissage et réflexion et leur relation avec le fonctionnement psychologique de l'individu. Ce cours est un prérequis pour la plupart des cours du Département et est normalement suivi de PSYCE 261.

PSYCE 261. *Comportement social et individuel.* ★3 (2ième semestre, 3-0-0). Introduction à l'étude de l'individualité humaine, de la personnalité et des processus sociaux. Le cours peut inclure l'étude de quelques aspects du développement humain normal et anormal, du jugement et du traitement psychologiques. Prérequis: PSYCE 260.

PSYCE 309. (Science) *Etudes des méthodes de statistiques pour les recherches de psychologie.* ★3 (demi-cours, 3-0-1). Application des méthodes de statistiques aux problèmes psychologiques; interprétation des données psychologiques en termes de moyennes, de mesures de variabilité et de mesures de relation; étude de la théorie de l'échantillonnage et tests d'hypothèses statistiques. Ce cours est reconnu comme l'équivalent de STAT 241 par la Faculté de Médecine (prérequis pour la Faculté de Médecine). Prérequis: Mathématiques 30, 100 ou l'accord du Doyen.

PSYCE 337. *Différences entre les individus.* ★3 (demi-cours, 3-0-0). Vue d'ensemble des conditions biologiques et sociales qui contribuent aux variations parmi les individus; méthodes pour décrire l'individualité. Prérequis: PSYCE 260/261 (ou un équivalent) et 309.

PSYCE 341. *Psychologie sociale.* ★3 (1er semestre, 3-0-0). Observation du comportement individuel, de groupe, dans les procédés sociaux. Prérequis: PSYCE 260/261 ou l'équivalent. Note: PSYCE 341 et SOC 341 peuvent être suivis tous les deux pour crédits.

PSYCE 352. (Science) *Comportement et génétique.* ★3 (demi-cours, 3-0-0). Prérequis: PSYCE 237 (ou 202) et BIOLE 297 ou 130 ou l'accord du Doyen.

PSYCE 353. *Psychologie de la croissance.* ★3 (2ième semestre, 3-0-0). Le comportement par rapport au développement normal et au vieillissement. Prérequis: PSYCE 260/261 (ou un équivalent).

PSYCE 360. (Science) *Psychologie générale expérimentale.* ★3 (demi-cours, 3-0-3). Cours conçu pour les spécialisations en Arts et traitant de l'application des méthodes expérimentales à un grand nombre de problèmes psychologiques. Prérequis: PSYCE 202 ou 260.

PSYCE 361. (Science) *Principes du changement de comportement.* ★3 (1er semestre, 3-0-0). Introduction aux techniques de changement de comportement. Le cours examinera l'origine de telles techniques dans l'expérimentation sur les animaux et la théorie de l'apprentissage, et fera une évaluation de leur efficacité quand elles sont appliquées aux populations qui ont des problèmes spécifiques. Prérequis: PSYCE 260 (ou 202). Note: les étudiants ne peuvent cumuler les crédits de PSYCE 365 et 361.

PSYCE 362. (Science) *Apprentissage et mémoire.* ★3 (2ième semestre, 3-0-3). Une étude des facteurs du fonctionnement de la mémoire humaine et particulièrement des facteurs cognitifs. Prérequis: PSYCE 260 (ou 202) et 309. Note: les étudiants ne peuvent cumuler les crédits de PSYCE 365 et 362.

PSYCE 375. (Science) *Cerveau et comportement.* ★3 (2ième semestre, 3-0-0). Introduction à la fonction du cerveau et à son rapport à la sensation, au mouvement, à l'apprentissage, à la motivation et à la pensée. Prérequis: PSYCE 260 (ou 202). Note: les étudiants ne peuvent cumuler les crédits de PSYCE 475 et 375.

PSYCE 383. *Personnalité.* ★3 (demi-cours, 3-0-0). Un aperçu des points de vue théoriques de représentation et travaux de recherches appliqués aux problèmes majeurs de l'étude de la personnalité. Prérequis: PSYCE 260/261 ou équivalent.

PSYCE 465. (Science) *Cognitive Processes.* ★3 (half-course, 3-0-3). An introduction to complex conceptual processes, and information processing theories. Topics include: concept formation, problem solving, and psycholinguistics. Prerequisite: Psychology 362 or 365.

PSYCE 489. *Psychologie de l'anormalité.* ★3 (demi-cours, 3-0-0). Introduction générale. Prérequis: PSYCE 202 ou 283 et 341.

PSYCE 492. *Créativité.* ★3 (demi-cours, 3-0-0). Théories et recherches relatives au processus de créativité, comprenant un essai de compréhension des manifestations du processus de créativité dans différents domaines. Prérequis: l'accord du Doyen.

PSYCE 496. (Science) *Etude personnelle I.* ★3 (1er semestre, 1-0-3). Cours destiné à permettre aux étudiants d'approfondir personnellement un sujet de leur choix (ce que le cadre d'un cours ne permet pas). Prérequis: accord du Doyen.

PSYCE 498. *Etude personnelle II.* ★3 (2ième semestre, 3-0-0). Cours destiné à permettre aux étudiants au niveau du baccalauréat d'approfondir personnellement un sujet de leur choix. Sous forme de bibliographie dirigée ou de travaux de laboratoire. Prérequis: l'accord du Doyen.

174.29 Psychologie de l'Education / Educational Psychology

PS ED 269. *Introduction à la Psychologie de l'éducation: Maturité et Développement.* ★3 (2ième semestre, 3-0-0).

PS ED 271. *Introduction to Educational Psychology: Learning.* ★3 (First Term, 3-0-0).

PS ED 467. *Apprentissage et développement à l'école élémentaire.* ★3 (3-0-0; 0-0-3). Prérequis: PS ED 269 ou 271 ou l'équivalent.

PS ED 468. *Apprentissage et développement à l'école élémentaire.* ★6 (3-0-3).

PS ED 469. *Développement humain et éducation.* ★3 (demi-cours, 3-0-0). Prérequis: PS ED 269 ou l'équivalent.

PS ED 471. *Apprentissage et enseignement.* ★3 (demi-cours, 3-0-0). Prérequis: PS ED 271 ou l'équivalent.

PS ED 473. *Langue et cognition dans l'éducation de l'enfant.* ★3 (3-0-0). Prérequis: PS ED 269 et 271 ou l'équivalent.

PS ED 477. *Psychologie du Langage, Cognition et Bilinguisme.*

PS ED 487. *Principes d'évaluation des classes.* ★3 (3-0-0). Prérequis: PS ED 269 et 271 ou l'autorisation du Doyen.

PS ED 489. *Elaboration des tests pour les enseignants.* ★3 (3-0-0). Prérequis: PS ED 269 et 271 ou l'autorisation du Doyen.

PS ED 497. *Séminaires "senior".* ★3 (3-0-0). Prérequis: l'autorisation du Doyen — Le contenu varie d'une année à l'autre — sujets sont annoncés avant la période d'inscription.

PS ED 499. *Etude individuelle dirigée en Psychologie de l'éducation.* ★3 (3-0-0). Prérequis: l'autorisation du Doyen.

174.30 Science Politique / Political Science

SC PO 201. *Introduction au Gouvernement.* ★3 (1er semestre, 3-0-0). Une introduction aux institutions canadiennes gouvernementales et autres gouvernements démocratiques. Sujets étudiés: constitutions, législatures, exécutifs, fonction publique, cours de justice, gouvernement fédéral, autres sujets sélectionnés. Note: (1) Auparavant, faisait partie de SC PO 200; (2) Enseigné en anglais pendant une période ne dépassant pas un (1) mois, au premier semestre de 1980-81.

SC PO 202. *Introduction à la politique.* ★3 (2ième semestre, 3-0-0). Une introduction au développement de la tradition démocrate. Sujets étudiées: pouvoir ou influence, démocratie, droits civils, idéologie politique, opinion publique, élections, partis politiques, groupes de pression et autres sujets sélectionnés. Note: Auparavant, faisait partie de SC PO 200.

SC PO 320. *Gouvernement et politique du Canada en tant que nation.* ★6 (3-0-0). Structure et fonction du Gouvernement Canadien, spécialement les Communes, le Sénat, le système de Cabinet, l'Administration civile et le rôle des partis politiques. Note: les étudiants qui ont suivi SC PO 321 ne peuvent suivre ce cours.

SC PO 380. *Politique comparée.* ★3 (demi-cours, 3-0-0). Introduction à des thèmes de politique comparée. Note: Précédemment SC PO 374.

SC PO 423. *Fédéralisme canadien.* ★3 (3-0-0). Analyse du développement et des théories du fédéralisme canadien. On étudiera en particulier les problèmes actuels du système fédéral.

SC PO 428. *Gouvernement et Politique des Provinces.* ★3 (demi-cours, 3-0-0). Etude des structures, des fonctions et des processus de certains gouvernements provinciaux au Canada. Prérequis: SC PO 320 ou 321, ou l'accord du Doyen.

174.31 Sociologie / Sociology

SOCIE 202. *Introduction à la Sociologie.* ★6 (3-0-0). Analyse de la société, les interrelations entre les groupes composants et les processus de la stabilité et du changement de la société. Analyse de la société dans sa structure, sa culture et ses principes de hièrarchisation. Les relations entre les diverses institutions, e.g. famille, église, école, gouvernement. Les

processus par lesquels la société socialise l'individu; les sources du comportement conformiste et non-conformiste. Note: Les étudiants en 3ième année et plus devraient suivre SOCIE 403 plutôt que SOCIE 202.

SOCIE 301. *Sociologie de la femme.* ★3 (demi-cours, 3-0-0). Etude comparée du rôle de la femme dans diverses sociétés, en insistant sur le Canada contemporain; on considérera ce qui détermine la structure du rôle de la femme. Changements parallèles dans le rôle de l'homme en tant que complémentaire.

SOCIE 320. *Problèmes sociaux.* ★6 (3-0-0). Analyse sociologique du concept de problème social dans une perspective historique et contemporaine; définitions, origines sociales et forces sociétales qui étiquettent et perpétuent certaines questions comme étant d'intérêt public; les sphères couvertes comprennent le comportement déviant, l'inégalité et les conflits dans leur rapport au milieu industriel, urbain et national, au Canada et ailleurs.

SOCIE 322. *Problèmes sociaux du Canada.* ★3 (3-0-0). Problèmes relatifs à des domaines tels que l'économie, l'autorité, les classes sociales, les valeurs collectives et l'instruction. Etude d'un certain nombre de groupes régionaux, ethniques et d'intérêt national et leurs implications pour d'autres arguments de la société canadienne. Note: Ce cours n'est pas accessible aux étudiants ayant pour crédit SOCIE 320 ou 321.

SOCIE 323. *Sociologie de la pauvreté.* ★3 (demi-cours, 3-0-0). Origine, sens et effets de la pauvreté, en insistant sur le Canada; perspectives théoriques sur la pauvreté; examen de la pauvreté dans différentes perspectives institutionnelles, telles que l'éducation, la santé, le droit et le logement; évaluation des programmes pour combattre la pauvreté.

SOCIE 361. *Organisation sociale.* ★3 (1er semestre, 3-0-0). Les systèmes sociaux, leurs composantes et leurs interrelations, les fondements de la différenciation et de l'intégration sociale. Prérequis: SOCIE 202.

SOCIE 367. *Systèmes de valeurs et de croyances.* ★3 (demi-cours, 3-0-0). Origines, développement et conséquences sociales des systèmes de croyances et de valeurs. Prérequis: SOCIE 202 ou 403.

SOCIE 368. *Etude des minorités et des groupes ethniques.* ★3 (2ième semestre, 3-0-0). Les problèmes qui surgissent dans les minorités et les groupes ethniques. La genèse des préjugés; les théories actuelles de la culture, des races, et les effets de contacts entre races et entre groupes minoritaires. Les situations limites. Prérequis: SOCIE 202 ou 403 ou l'accord du Doyen.

SOCIE 371. *La famille.* ★3 (demi-cours, 3-0-0). Structure et fonction du système familial vu dans le contexte de l'histoire et de la rencontre des cultures. Etude du système familial dans les sociétés contemporaines, soulignant les aspects caractéristiques de l'institution et ses tendances actuelles. Prérequis: SOCIE 202 ou 403.

SOCIE 411. *Méthodes de recherche sociale.* ★3 (demi-cours, 3-0-0). Le format de projets de recherche en sciences sociales; hypothèses en recherche sociale, évaluation de la recherche et de ses styles, développement des inventaires proposés, format expérimental, échantillons, principes de mesures et d'équivalences, procédures de validation, création de questionnaires, entrevues, observation des participants. Prérequis: SOCIE 311. Note: Précédemment SOCIE 412.

SOCIE 432. *Développement de la sociologie.* ★3 (demi-cours, 3-0-0). Vue d'ensemble du développement de la théorie sociologique de 1820 à nos jours. Accent particulier sur l'étude des perspectives ouvertes par les théories majeures. Prérequis: SOCIE 202 ou 403.

SOCIE 447. *Leadership.* ★3 (demi-cours, 3-0-0). Dynamique de groupe et discernement des leaders. Différents systèmes sociaux. Prérequis: SOCIE 341 ou PSYCE 341.

SOCIE 460. *Organisation sociale — Théorie organisationnelle.* ★3 (1er semestre, 3-0-0). Modèles de l'organisation sociale, unités de la structure sociale; bases de l'intégration sociale; contrôle social et changement social. Prérequis: SOCIE 361.

SOCIE 467. *Classes sociales de la société moderne.* ★3 (demi-cours, 3-0-0). Stratification sociale dans la société de l'Ouest, faisant référence aux effets de l'industrialisation. Analyse comparée des sociétés primitives. Une attention spéciale sera donnée aux bases de la stratification, de la structure et du fonctionnement des systèmes de classes sociales; la mobilité sociale et les classes spéciales dans la société moderne, p.e. les professionnels, les travailleurs manuels, les élus au pouvoir. Prérequis: SOCIE 202 ou 403.

SOCIE 469. *Sociologie du travail et des loisirs.* ★3 (2ième semestre, 3-0-0). La nature, la signification et les fonctions du travail dans un contexte historique et culturel; l'analyse sociale du travail et des loisirs; la signification et les utilisations changeantes du temps consacré aux loisirs. Prérequis: SOCIE 202 ou 403.

SOCIE 471. *Etude comparée des systèmes familiaux.* ★3 (demi-cours, 3-0-0). Analyse sur le plan institutionnel des ressemblances et des différences entre les systèmes familiaux de diverses sociétés contemporaines complexes. Prérequis: SOCIE 202 ou 403; et 371.

SOCIE 472. *La société canadienne.* ★3 (demi-cours, 3-0-0). Composition de la population canadienne; hiérarchie des valeurs, nature et relations entre les principales institutions et structure de la société canadienne. Prérequis: SOCIE 202 ou 403.

SOCIE 480. *Changement social.* ★3 (demi-cours, 3-0-0). Signification du changement dans les systèmes sociaux et culturels; théories du changement social; problèmes des changements introduits dans certaines cultures. Prérequis: SOCIE 202 ou 403.

SOCIE 481. *Etudes sociales de régions canadiennes.* ★3 (demi-cours, 3-0-0). Une attention particulière sera donnée périodiquement à l'une ou l'autre de ces régions (e.g., Société Québécoise, Société des Maritimes, Société des Prairies, Changement social dans le Nord du Canada, etc). Prérequis: SOCIE 361.

Faculty of Science

181 INTRODUCTORY

181.1 Members of the Faculty

181.1.1 OFFICERS OF THE FACULTY

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Associate Deans
D. D. BEATTY, Ph.D.
J. KUSPIRA, Ph.D.
J. L. MAHRT, Ph.D.

Assistant to the Dean
W. E. RANDALL, B.Sc.

181.1.2 INTRODUCTORY BIOLOGY PROGRAM

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D. D. BEATTY, Ph.D.

Laboratory Co-ordinators
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R. HAAG, M.Sc.
C. MINER, M.Sc.
M. J. TURTLE, M.Sc.

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P. R. GORHAM, Ph.D., D.Sc., F.R.S.C. (Plant Physiology)
L. L. KENNEDY, Ph.D. (Mycology)
G. H. LA ROI, Ph.D. (Ecology)
W. MOSER, D.Phil. (Ecology)
J. G. PACKER, Ph.D. (Taxonomy)
D. H. VITT, Ph.D. (Bryology and Lichenology)

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M. HICKMAN, Ph.D. (Limnology and Phycology)
J. M. MAYO, Ph.D. (Plant Physiology)

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R. A. STOCKEY, Ph.D. (Paleobotany)
D. W. WHITFIELD, Ph.D. (Ecological Modelling)

181.1.4 DEPARTMENT OF CHEMISTRY

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Killam Professor
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W. A. AYER, Ph.D. (Natural Products)
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Curator of Paleontology Collections
B. JONES, Ph.D. (Biostratigraphy)

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A. SHARMA, Ph.D.
(Interpolation and Approximation)
M. V. SUBBARAO, Ph.D.
(Number Theory)
J. G. TIMOURIAN, Ph.D. (Algebraic Topology)

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N. A. AL-SALAM, Ph.D. (Special Functions)
K. F. ANDERSEN, Ph.D. (Functional Analysis)
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G. A. CHAMBERS, Ph.D. (Group Theory)
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G. LUDWIG, Ph.D. (Relativity Theory)
R. L. McKINNEY, Ph.D. (Convexity and Topology)
T. B. MOODIE, Ph.D.
(Applied Mathematics)
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S. D. RIEMENSCHNEIDER, Ph.D.
(Functional Analysis)
T. D. ROGERS, Ph.D. (Differential Equations)
R. G. SINCLAIR, Ph.D. (Differential Equations)
R. J. TAIT, Ph.D. (Applied Mathematics)
J. R. TROLLOPE, Ph.D. (Relativity)
Z. M. TROLLOPE, M.Sc. (Asymptotics)
F. USTINA, Ph.D. (Fourier Series)
S. W. WILLARD, Ph.D. (General Topology)

Assistant Professors

. BAGGS, Ph.D. (Statistics, Topology)
3. CLIFF, Ph.D. (Algebra)
J. E. LEWIS, Ph.D. (Functional Analysis)
A. C. LIU, Ph.D. (Combinatorics and Hypergraphs)
M. E. McLEISH, Ph.D. (Combinatorics / Applications to Computing Science)
J. SCHERK, D.Phil. (Algebraic Geometry)
H. WOLKOWICZ, Ph.D.
(Applied Mathematics)
W. S. YOUNG, Ph.D. (Harmonic Analysis)

181.1.11 DEPARTMENT OF MICROBIOLOGY

Professor and Chairman

D. W. S. WESTLAKE, Ph.D.

Professors

J. N. CAMPBELL, Ph.D.
F. D. COOK, Ph.D.
G. W. STEMKE, Ph.D.
R. G. von TIGERSTROM, Ph.D.
T. YAMAMOTO, Ph.D.

Associate Professors

W. J. PAGE, Ph.D.
M. PICKARD, Ph.D.
K. L. ROY, Ph.D.

Associate Member

M. E. STILES, Ph.D.

181.1.12 DEPARTMENT OF PHYSICS

Professor and Chairman

A. N. KAMAL, Ph.D. (Theoretical Physics)

Associate Professor and Associate Chairman

J. GRAY, Ph.D. (Geophysics)
(Acting from Jan. 1 - Dec. 31, 1981)
J. A. KERNAHAN, Ph.D. (Astrophysics)
(on leave Jan. 1, 1981 ——)

Killam Memorial Professor of Science

H. UMEZAWA, Ph.D. (Theoretical)

Professors

J. G. ADLER, Ph.D.
(Low Temperature Solid State Physics)
A. B. BHATIA, Ph.D., F.R.S.C.
(Theoretical Physics)
J. M. CAMERON, Ph.D. (Nuclear Physics)
A. Z. CAPRI, Ph.D. (Theoretical Physics)
G. L. CUMMING, Ph.D. (Geophysics)
W. K. DAWSON, Ph.D. (Nuclear Physics)
J. P. FRANCK, Dr. rer. Nat.
(Low Temperature Solid State Physics)
D. I. GOUGH, Ph.D., F.R.S.C.
(Geomagnetism; Induced Seismicity)
D. G. HUGHES, Ph.D.
(Nuclear Magnetic Resonance in Solids)
W. ISRAEL, Ph.D., F.R.S.C. (Relativity)
F. W. JONES , Ph.D. (Geophysics)
E. R. KANASEWICH, Ph.D., F.R.S.C. (Geophysics)
P. KITCHING, Ph.D. (Nuclear Physics)
H. J. KREUZER, Dr. rer. Nat.
(Theoretical Physics)
W. J. McDONALD, Ph.D. (Nuclear Physics)
G. A. MOSS, Ph.D. (Nuclear Physics)
G. C. NEILSON, Ph.D. (Nuclear Physics)
K. B. NEWBOUND, Ph.D. (Dean of Science)
W. C. OLSEN, Ph.D. (Nuclear Physics)
B. V. PARANJAPE, Ph.D. (Theoretical Physics)
E. H. PINNINGTON, Ph.D.
(Atomic Spectroscopy)
D. RANKIN, Ph.D. (Geophysics)
M. RAZAVY, Ph.D. (Theoretical Physics)
G. ROSTOKER, Ph.D. (Space Physics)

G. ROY, Ph.D. (Nuclear Physics)
J. T. SAMPLE, Ph.D.
(on leave, Director of TRIUMF)
H. SCHIFF, Ph.D. (Theoretical Physics)
S. S. SHEININ, Ph.D.
(Electron Microscopy)
D. M. SHEPPARD, Ph.D. (Nuclear Physics)
Y. TAKAHASHI, D.Sc. (Quantum Field Theory)
F. L. WEICHMAN, Ph.D.
(Optics in Semiconductors)
S. B. WOODS, Ph.D.
(Low Temperature Solid State Physics)

Associate Professors
W. BROUWER, Ph.D. (Theoretical Physics and Secondary Education)
R. F. EGERTON, Ph.D. (Electron Microscopy)
M. E. EVANS, Ph.D. (Geophysics; Paleomagnetism)
J. GRAY, Ph.D. (Geophysics)
F. HRON, D. Nat. Sci. (Geophysics)
D. P. HUBE, Ph.D. (Close Binary Stars)
E. NYLAND, Ph.D. (Planetary Interiors)
J. S. ROGERS, Ph.D.
(Low Temperature Solid State Physics)
J. C. SAMSON, Ph.D. (NSERC Univ. Research Fellow) (Space Physics)
H. S. SHERIF, Ph.D.
(Theoretical-Nuclear Physics)
J. STEPHENSON, Ph.D. (Theoretical Physics)

Assistant Professors
T. J. SPANOS, Ph.D. (Geophysics, AOSTRA Appointment)
P. S. WESSON, Ph.D. (NSERC Univ. Research Fellow) (Theoretical Physics)

Research Associate Professors (TRIUMF)
D. P. GURD, Ph.D.
G. M. STINSON, Ph.D.
D. A. HUTCHEON, Ph.D.

Laboratory Supervisors
D. J. AUSTEN, Ph.D.
G. R. SMALL, M.A.

Honorary Professors
J. A. JACOBS, D.Sc. (Planetary Physics)
T. R. OVERTON, Ph.D. (Radiation Biophysics)
S. R. USISKIN, Ph.D. (Radiation Biophysics)

Honorary Associate Professors
J. W. SCRIMGER, Ph.D. (Radiation Biophysics)
R. E. SNYDER, Ph.D. (Biomedical Engineering)

181.1.13 DEPARTMENT OF PSYCHOLOGY

Professor and Chairman
T. M. NELSON, Ph.D.

Professors
C. M. BOURASSA, Ph.D.
D. W. CURTIS, Ph.D.
V. DI LOLLO, Ph.D.
E. HOWARTH, Ph.D.
J. R. ROYCE, Ph.D.
W. W. ROZEBOOM, Ph.D.
B. G. RULE, Ph.D.
S. J. RULE, Ph.D.
W. N. RUNQUIST, Ph.D.
P. SWARTZ, Ph.D.
T. E. WECKOWICZ, Ph.D.

Associate Professors
C. H. BECK, Ph.D.
A. R. DOBBS, Ph.D.
M. ENZLE, Ph.D.
D. GRANT, Ph.D.
D. KUIKEN, Ph.D.
E. LECHELT, Ph.D.
D. PERRY, Ph.D.
P. RUNQUIST, Ph.D.
B. K. SINHA, Ph.D.
D. SPEARMAN, Ph.D.
R. E. WALLEY, Ph.D.
K. V. WILSON, Ph.D.

Assistant Professors
J. H. BISANZ, Ph.D.
W. F. EPLING, Ph.D.
A. R. FRIEDMAN, Ph.D.
D. C. HETH, Ph.D.
G. L. WELLS, Ph.D.

Research Associate
T. H. NILSSON, Ph.D.

181.1.14 DEPARTMENT OF STATISTICS AND APPLIED PROBABILITY

Chairman
To be appointed

Professors
S. G. GHURYE, Ph.D. (Mathematical Statistics)
J. R. McGREGOR, Ph.D. (Mathematical Statistics)
K. L. MEHRA, Ph.D. (Mathematical Statistics)
T. V. NARAYANA, Ph.D. (Mathematical Statistics)

Associate Professor
D. L. McLEISH, Ph.D. (Statistics)

Assistant Professors
P. M. HOOPER, Ph.D. (Statistics)
D. H. KELKER, Ph.D. (Statistics)

181.1.15 DEPARTMENT OF ZOOLOGY

Professor and Chairman
F. S. CHIA, Ph.D.

Professor and Associate Chairman
J. S. NELSON, Ph.D.

Professors
D. D. BEATTY, Ph.D.
D. A. BOAG, Ph.D.
H. F. CLIFFORD, Ph.D.
R. C. FOX, Ph.D.
W. A. FULLER, Ph.D.
J. C. HOLMES, Ph.D.
J. K. LAUBER, Ph.D.
V. LEWIN, Ph.D.
S. K. MALHOTRA, Ph.D.
J. R. NURSALL, Ph.D.
R. E. PETER, Ph.D.
R. F. RUTH, Ph.D.
A. L. STEINER, D.Sc.
L. WANG, Ph.D.
S. E. ZALIK, Ph.D.
F. C. ZWICKEL, Ph.D.

Associate Professors
J. F. ADDICOTT, Ph.D.
W. C. MACKAY, Ph.D.
J. L. MAHRT, Ph.D.
J. O. MURIE, Ph.D.
W. M. SAMUEL, Ph.D.
A. N. SPENCER, Ph.D.

Assistant Professors
W. R. KAUFMAN, Ph.D.
A. R. PALMER, B.S.
E. E. PREPAS, Ph.D.
N. E. STACEY, Ph.D. (NSERC Univ. Research Fellow)
M. V. H. WILSON, Ph.D.

Professor Emeritus
D. M. ROSS, Ph.D., Sc.D., F.R.S.C.

Honorary Associate Professor
I. G. STIRLING, Ph.D.

Honorary Research Associates
G. R. MICHENER, Ph.D.
T. E. REIMCHEN, Ph.D.
J. D. SOPER, LL.D.

181.1.16 PROFESSOR OF THEORETICAL BIOLOGY

C.I.J.M. STUART, M.A.

181.1.17 ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Professors
W. BROUWER, Ph.D. (Education)
D. DESMARAIS, M.Sc. (Faculté Saint-Jean)
J. ELBRINK, Ph.D. (Pharmacology)
M. G. FAULKNER, Ph.D. (Engineering)
J. FORD, M.Sc. (Nursing)
A. FRENCH, Ph.D. (Physiology)
H. A. HARGREAVES, Ph.D. (Arts)
Z. J. HAWRYSH, Ph.D. (Home Economics)
B. S. HEMING, Ph.D. (Entomology)
M. JENDYK, L.U.D. (Arts)
R. A. LOCOCK, Ph.D. (Pharmacy and Pharmaceutical Sciences)
N. B. MADSEN, Ph.D. (Medicine and Biochemistry)
H. A. QUINNEY, Ph.D. (Physical Education and Recreation)
W. F. REESE, Ed.D. (Education)
J. A. ROBERTSON, Ph.D. (Agriculture and Forestry)

Representative
R. A. McINTOSH, P.Geol. Association of Professional Engineers, Geologists and Geophysicists of Alberta

Registrar of the University
W. A. BLANCHARD, Ph.D.

12 Undergraduate Students of the Faculty of Science

182 FACULTY REGULATIONS

182.1 Admission

The admission requirements of the Faculty of Science will be found in § § 13.1 and 13.18 of the University Regulations and Information for Students Calendar.

To enter the Faculty of Science a student must complete five courses at the Grade XII level. These must include English 30, Mathematics 30, at least two of the following four sciences, Biology 30, Chemistry 30, Mathematics 31 and Physics 30, and a fifth 30-level course which should preferably be one of the aforementioned sciences or possibly a second language, e.g., French or German, or Social Studies or Social Sciences.

182.2 General Information

The Faculty of Science is, with the Faculty of Arts, the oldest established faculty at The University of Alberta, instruction in Arts and Science having begun in 1908. It offers instruction in the Biological Sciences (Botany, Genetics, Microbiology, Zoology), Chemistry, Computing Science, Geography, Geology, Linguistics, Mathematics, Physics and Psychology.

The Faculty offers three main types of programs leading to the degree of B.Sc.: four-year Honors programs; four-year Specialization programs and three-year General programs.

The four-year Honors programs are established primarily for students who seek careers in scientific research. They provide preparation for admission to graduate studies; to a Master of Science program or even in some cases to a Doctor of Philosophy program.

The three-year General program aims to provide general education with a scientific emphasis for students who seek careers in business, in teaching, in medicine and dentistry, etc.

The four-year Specialization programs aim to bridge the gap between the three-year program and the Honors program. They can provide the background necessary for admission to Graduate Studies in some cases, and in any event do permit the attainment of a professional status.

It should be noted that in many cases transfer from one program to another can be arranged easily to suit changing ambitions, needs, or academic qualifications of the student.

Regulations governing the Honors, Specialization, and General B.Sc. programs will be found in § 183.1, below, followed by descriptions of these programs arranged under subject headings in § § 183.2 to 183.21.

In addition, the Faculty of Science participates in an inter-disciplinary program in Food Science jointly with the Faculty of Agriculture and Forestry and the Faculty of Home Economics. This program is described in § 183.22. Two-year pre-Dental and pre-Medical programs may be taken in the Faculty, as described in § 183.27.

NOTE: Where approval or permission of the Dean of Science is required, this may be obtained from the Dean of the Faculty or one of the Associate Deans.

Specifically, the Honors and Specialization Programs require the following Science courses:

Biochemistry: Biology 30; Chemistry 30 and Physics 30.
Botany: Chemistry 30 and Biology 30; Physics 30 is recommended.
Chemistry: Chemistry 30 and Physics 30; Mathematics 31 is recommended.
Computing Science: Honors — Mathematics 31 and Physics 30.
Entomology: Biology 30, Chemistry 30 and Physics 30.
Genetics: Biology 30 and Chemistry 30.
Geography (Meteorology): Physics 30; Mathematics 31 is recommended.
Geography (Survey Science): Physics 30.
Geology: Chemistry 30 and Physics 30.

Linguistics: Biology 30; Physics 30 is recommended.
Mathematics: Physics 30; Mathematics 31 is recommended.
Microbiology: Biology 30 and Chemistry 30; Physics 30 is recommended.
Pharmacology: Biology 30, Chemistry 30 and Physics 30.
Physics: Physics 30 and Mathematics 31; Chemistry 30 is recommended.
Physiology: Biology 30, Chemistry 30 and Physics 30.
Zoology: Biology 30 and Chemistry 30; Physics 30 is recommended.

The minimal requirements to enter the Faculty of Science as outlined in Paragraph 2 above are sufficient to enter the Honors and Specialization programs in Geography (except Survey Science) and Psychology.

Students intending to enter the Pre-Medical and Pre-Dental programs must take Biology 30 and Chemistry 30. Physics 30 is highly recommended as the fifth subject.

English Language Proficiency:

(a) Applicants with TOEFL scores of 600 or more will be accepted unprovisionally into the Faculty of Science. Students will also be accepted unprovisionally if they have demonstrated proficiency in English in one of the other forms outlined in Section 14.3 of the University Regulations and Information for Students calendar. These students will not be required to take any E.L.P. courses offered by the Faculty of Extension.

(b) Students with TOEFL scores of 550 to 599 inclusive will be admitted as Probationary Students. These students will be required to complete successfully one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in their regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated by attaining a TOEFL score of 600 (or its equivalent in other approved standard tests).

NOTE: This means that Probationary Students will not be permitted to register in a further academic year unless they have:

(i) completed successfully all the E.L.P. courses that they were required to take by the E.L.P. Office in the Faculty of Extension, and

(ii) achieved a TOEFL score of at least 600.

(c) Applicants with TOEFL scores lower than 550 will not be accepted into the Faculty of Science.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta; or by writing direct to Educational Testing Service, Princeton, New Jersey, U.S.A., 08540.

Transfer from other Faculties in the University: Students from degree programs of other Faculties may transfer to the Faculty of Science by submitting a re-enrollment form to the Faculty of Science Office. Advanced credit will be given for completed course work which is applicable in the desired science program. If there are deficiencies in matriculation, these may have to be rectified. Credit will not normally be given for course work of a professional nature. Students contemplating a change in Faculty should consult the Office of the Dean of Science as soon as possible to obtain an analysis of their position.

182.2 Courses

(1) *Selection of courses.* Students registered in the Faculty of Science must select courses from those set out in the Arts and Science Calendar (§ § 44 and 184). In some instances, courses from other faculties may be permitted by the Dean.

(2) *Selection of first-year courses.* Students shall restrict their first-year registration to five full-session or equivalent junior courses (those numbered less than 300). Senior courses (those numbered 300 or higher) may be taken in the first year only with the consent of the department concerned and the approval of the Dean.

(3) *Single-term courses.* A number of courses are offered in one term only; two such courses are recognized as the equivalent of one full-session course. Where the curriculum requires a full-session course in a particular subject or classification, both single-term courses must be chosen from that subject or classification; where the requirement is for an option, any two single-term courses may be combined to meet the requirement, e.g., an Arts option in the same or different subjects.

(4) *Normal course load.* A full normal academic course load is 5 full-session courses or the equivalent during the winter session.

(5) *Withdrawal from courses.* The deadlines for withdrawing from courses or changing to "audit" status are as follows: from a full-session course, February 12; from a single-term course taken in the First Term, November 12; from a single-term course taken in the Second Term, March 1.

Courses from which the student withdraws up to and including the last day for registration in the first and second terms will not appear on the student's record. Courses from which the student withdraws after the last day of registration and up to and including the last day for dropping courses will appear with a grade of "W" (Withdrew with permission) on the transcript.

(6) Science courses are those included in the Science section of the Calendar and Arts courses are those included in the Arts section of the calendar.

(7) *Statistics Courses.* Students registered in the Faculty of Science wishing to study statistics would take courses listed in § 184.31. Courses in statistics offered by other Faculties may not normally be taken for degree credit in the Faculty of Science. Courses such as PSYCO 309 and CMPUT 321 and 322 are normally limited to students with programs in those areas.

182.3 Credit by Challenge

A student who may have carried on systematic studies which may be equatable to a junior course creditable in the Faculty of Science and who has been unable to obtain the equivalent advanced standing may obtain Credit by Challenge. Credit by Challenge may be obtained by application to the Office of the Dean of Science and the Department concerned which may require the student to write a regular final or supplemental examination covering the material of the course being challenged. The regular fee for a special supplemental examination will be levied in such case.

182.4 *Academic Standings and Graduation*

The following regulations apply throughout the Faculty of Science:

(1) Students who fail half or more of the courses in which they are registered, and those whose Quality Index (Q.I.) is 2.0 or less, are normally deemed to have an extremely unsatisfactory record (category C) and will be required to withdraw from the Faculty. The Quality Index is defined in § 42.5. (See § 16.4.5 of the University Regulations and Information for Students Calendar.) With respect to courses taken during the winter session just prior to compulsory withdrawal, credit will be granted only for those courses with grades of 5 and higher.

(2) No student will be considered for readmission to the Faculty of Science after a second extremely unsatisfactory year (category C).

(3) A student who is repeating a year after being required to withdraw will be required to take a full course load (five full-session courses or the equivalent) during the winter session and must pass all courses and obtain a grade-point average of at least 5.0 to be allowed to continue in the Faculty.

(4) A grade of 4 in a prerequisite course represents the minimum requirement for admission to a course with prerequisite requirement.

(5) First-class standing in a given year shall be awarded to any student who obtained a grade-point average of not less than 7.5 while enrolled in a full, normal academic load (five full-session courses or the equivalent) during the winter session.

(6) The notation "With Distinction" is inscribed on the permanent record and graduate parchment of a candidate for a General or Specialization degree if the candidate has obtained a grade-point average of at least 7.5 over the last ten full-session courses or the equivalent provided the student was enrolled in a full, normal academic load during the winter sessions of the last two years.

(7) Supplemental examinations may be granted by the Dean in cases where the weight assigned to the final examination is 40% or higher. A student may not write more than two supplemental examinations in any academic year, whether for the purpose of obtaining passing marks or of raising the grade-point average to the required level.

(8) The basis for scholarship consideration is passing grades in all courses in a five full-course load or equivalent during the winter session.

(9) All requirements for graduation at Spring convocation must be met by the end of winter session. Those completing degree requirements during Spring and Summer Sessions will graduate at the Fall convocation.

Further regulations regarding academic standing, promotion, and graduation vary from program to program within the Faculty of Science, and are therefore given in § 183 below. Regulations for Honors, Specialization and General programs will be found in § 183.1. Regulations for the inter-disciplinary program in Food Science will be found in § 183.22, and for Pre-Medical and Pre-Dental programs in § 183.27.

183 PROGRAMS OF STUDY

183.1 *The Degree of B.Sc. in the Honors, Specialization, and General Programs*

183.1.1 HONORS PROGRAMS

A minimum of twenty full-session courses or the equivalent, normally taken in four consecutive academic years, is required for the completion of the Honors program for the degree of B.Sc. with Honors. These programs are designed to provide specialization in the chosen subject or subjects together with a longer training than that in the general program, as well as the higher standard implied by the term "Honors".

Honors programs are available in the Departments of Biochemistry, Botany, Chemistry, Computing Science, Entomology, Genetics, Geography, Geology, Linguistics, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology and Zoology. Honors is the preferred program for students planning to pursue graduate study.

Admission. Permission to enter first-year Honors is granted to students with high matriculation standing and with the approval of the Dean of the Faculty and the department concerned. A request for this privilege should be made on the "Application for Admission" form.

Students need not commit themselves to Honors in the first year, and may register in an appropriate selection of courses as required by the regulations of a four-year program or of a General Program. If a sufficiently high standard is obtained in the first year, the student may enter Honors in the second year. A student desiring to do so must submit a re-enrolment form to the Office of the Dean of Science during the period between the end of the first year and the time of registration for a second year.

Consideration will also be given to applications for transfer to Honors submitted by students who have completed the second, or even third, year of another program.

Selection of courses. The following regulations govern Honors programs:

(1) In each year, an Honors student's program must be approved by an Honor's advisor in the student's Department and by the Dean.

(2) A minimum of 12 full-session courses or the equivalent in Science is required in all Honors programs. Certain Departments may require more than 12 full-session Science courses.

(3) A student must take at least three full-session Arts courses or the equivalent as part of the requirements for the Honors degree.

(4) Normally no more than seven full-session junior courses or the equivalent are permitted in Honors programs.

(5) Students in Honors programs must take at least five full-session courses or the equivalent during the winter session of each year of the program. Exceptions to this requirement must be approved by the Department and the Dean.

(6) Certain non-Arts and non-Science courses appropriate to the program may be permitted in Honors

programs with the approval of the Dean and the Department in which the student is taking the program.

Academic standings and graduation. The following regulations govern Honors programs:

(1) Promotion from first year to second year, as well as from second to third and from third to fourth, is by recommendation of the Department concerned, for which a grade-point average of at least 6.0 is required.

See description of Honors programs of individual Departments for additional requirements for remaining in and promotion in the Honors program.

(2) A student who fails to attain the standard necessary for continuance in Honors must withdraw from the Honors program. In so doing the student may transfer to a Specialization program with the appropriate Department's approval or the General program in the Faculty of Science or a program in another Faculty.

(3) A student who is not recommended to continue in Honors at the end of the third year, or who fails to complete the requirements for a degree with Honors in the fourth year, may transfer to a Specialization program with Departmental approval or may be granted the General degree or the Specialization degree forthwith, provided that the courses taken and the standing attained are satisfactory.

(4) A student who, for any reason, is unable to return to university for the fourth year may apply for a General degree under the same conditions as one who has failed to meet the required standards.

(5) An Honors program may be interrupted only by special permission of the Department and the Dean.

(6) Degrees with Honors are awarded in two classes, First Class Honors and Honors. For First Class Honors, a grade-point average of at least 7.5 on all courses over the last two years is required. For Honors, a grade-point average of at least 6.0 in all years of the program is required. See description of Departmental Honors program for additional requirements for First Class Honors and Honors degrees.

(7) A student transferring to the Faculty of Science with advanced standing will be required to complete at least ten (normally the last ten) full-session courses or the equivalent at The University of Alberta.

(8) Students transferring to Honors from Specialization or General programs or other Faculties or Universities with credit for fewer than five full-session courses or a multiple thereof are allowed to make up the deficiency or deficiencies, i.e., one-half to four and one-half courses, before, during, or after taking the full program of courses in each of the winter sessions after entering the Honors program.

(9) Grades of 3 will not be considered for credit except under special circumstances in the fourth (final) year.

183.1.2 SPECIALIZATION PROGRAMS

Four-year programs, comprising a minimum of twenty full-session courses or the equivalent, are available providing education to a professional level and leading to the degree of B.Sc. with specialization in: Biochemistry, Botany, Chemistry, Computing Science, Entomology, Genetics, Geography, Geology, Linguistics, Mathematics, Microbiology, Pharmacology, Physics, Psychology and Zoology.

Selection of courses. The following regulations govern Specialization programs:

(1) In each year, a Specialization student's program must be approved by a Specialization advisor in the appropriate Department and by the Dean.

(2) A minimum of twelve full-session courses, or the equivalent, in Science is required in all Specialization programs. Certain Departments may require more than twelve full-session Science courses or the equivalent.

(3) A student must take at least three full-session Arts courses or the equivalent as part of the requirements for the Specialization degree.

(4) Normally no more than seven full-session junior courses or the equivalent are permitted in Specialization programs.

(5) Certain non-Arts and non-Science courses appropriate to the program may be permitted in Specialization programs with the approval of the Dean and the Department in which the student is taking the program.

Academic standings and graduation. The following regulations govern Specialization programs:

(1) For graduation, a program of at least twenty full-session courses or the equivalent must be completed with a grade-point average of at least 5.5 in all courses credited to the degree after the first year. In certain Departments, a grade of at least 6 is required for specified courses. The normal course load during each winter session is five full-session courses or the equivalent. The Dean and the Department may permit a student to proceed to a degree over a longer period of time than four years.

(2) A student who fails to attain the standard necessary for continuation in the Specialization program may be required (by the Department) to withdraw from that program. Re-instatement in the Specialization program may be possible. Consult a student adviser in the Department regarding minimal requirements for readmission.

(3) Grades of 3 will not be considered for credit except under special circumstances in the fourth (final) year.

(4) A student who is not recommended to continue in Specialization at the end of the third year or who fails to complete the requirements for a Specialization degree in the fourth year may be granted the General B.Sc. degree forthwith provided that the courses taken and the standing attained are satisfactory.

(5) B.Sc. Specialization degrees with Distinction are awarded when students achieve a grade-point average of 7.5 or higher over the last ten full-session courses or the equivalent provided the student was enrolled in a normal course load during the winter sessions of the last two years.

(6) A student transferring to the Faculty of Science with advanced standing will be required to complete at least ten (normally the last ten) full-session courses or the equivalent at The University of Alberta.

183.1.3 GENERAL PROGRAMS

General programs in the Faculty of Science are designed to enable the student to obtain a diversified education in more than one branch of study within the limits of a three-year program. The basic outline of the program is as follows:

First Year: Arts option; three Science courses; one option.

Second Year: An Arts course; three Science courses; one Arts or Science option.

Third Year: An Arts course; two Science courses; two Arts or Science options.

Selection of Courses: The following regulations govern General programs:

(1) In each year, a student's program must be approved by the Dean or his/her designee. Students in Pre-Dental and Pre-Medical programs must consult the Dean with respect to selection of courses in each year

of the program. Other General program students must consult either the Dean or an advisor in the Department representing the principal subject of concentration regarding selection of courses in each year of the program.

(2) To obtain a General B.Sc. degree a student must pass 15 full-session courses or the equivalent. Of these at least 8, and no more than 12 full-session courses or the equivalent must be Science courses, and at least 3, and no more than 7 full-session courses or the equivalent, must be Arts courses.

(3) Each student must take at least 4 and no more than 6 full-session courses or the equivalent, in the principal subject of concentration which must be one of the Sciences, and a minimum of 3 and a maximum of 4 full-session courses or the equivalent, in a second subject of concentration which must also be one of the Sciences. In each subject of concentration, no more than two full-session courses or the equivalent can be at the junior level.

(4) Normally no more than 7 full-session junior courses or the equivalent are permitted in the General program.

(5) Up to the equivalent of one full-session course approved by the Dean may be taken from Faculties other than Arts and Science. Such courses are considered as "approved options" and are not to be included either as part of the minimum of three full-session courses or the equivalent in Arts or in the minimum of eight full-session courses or the equivalent in Science. Under certain circumstances a student may be permitted by the Dean to take up to the equivalent of one additional full-session non-Arts and non-Science course in subjects closely related to those offered by the Faculty of Science, e.g., Animal Science, Plant Science and Soil Science.

Academic Standings and Graduation: The following regulations govern General programs:

(1) To obtain a B.Sc. General degree, a grade-point average of at least 5.5 must be attained on the last 10 full-session courses or the equivalent credited to the degree. Moreover, a grade-point average of at least 5.5 must be attained for all courses in the principal subject of concentration.

(2) A grade of 3 may be accepted as a passing grade in no more than one full course or two half courses and then only from among the last five full-session courses or the equivalent credited to the degree. Moreover, such credit may not be obtained in courses comprising the principal or second subject of concentration.

(3) The Dean may permit a student to proceed to a degree over a longer period than three years, or to meet the requirements in a shorter time by attending Spring and/or Summer Sessions or by taking extra courses during the Winter Session.

(4) B.Sc. General degrees with Distinction are awarded when students achieve a grade-point average of 7.5 or higher over the last 10 full-session courses or the equivalent, provided the student was enrolled in a normal academic load (five full-session courses or the equivalent) during the Winter Sessions of the last two years.

(5) A student transferring to the Faculty of Science with advanced standing will be required to complete at least 5 (normally the last 5) full-session courses or the equivalent at The University of Alberta.

Sections 183.2 and following contain advice offered by the various Science Departments to students selecting courses in their subjects of concentration. Further information may be obtained by consulting members of the Department concerned.

183.1.4 SPECIAL CERTIFICATES

Students who have received a B.Sc. degree and who meet the requirements for one of the Specialization Programs or for one of the Honors Programs by the addition of a minimum of five full courses or the equivalent will be awarded a Special Certificate to recognize the additional qualification. The specific requirements for this Certificate are determined for each student by the appropriate Department and the Dean.

183.1.5 THE B.SC. AFTER A PREVIOUS DEGREE

Requirements for B.Sc. after B.Ed. Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.Sc. degree in the General Program by completing at least six full-session courses or the equivalent and attaining a grade-point average of 5.5 in these courses. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students proposing to obtain the General B.Sc. in this manner will be expected to select their courses in conformity with the requirements of the General program outlined in § 183.1.3. To receive the B.Sc. General degree, the student must complete at least ten full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs. At least six of these full session courses must be senior ones. If a student holding a B.Ed. degree wishes to obtain an Honors or Specialization degree in the Faculty of Science, the student must complete at least eleven full-session courses or the equivalent and meet the requirements of the four-year program as specified by the Department in which the student is majoring. The student must complete at least fourteen full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs.

Requirements for B.Sc. after B.A. Holders of the B.A. General degree may qualify for the B.Sc. General degree by completing at least nine full-session courses or the equivalent and attaining a grade-point average of at least 5.5 in these courses. Students proposing to obtain the General B.Sc. in this manner will be expected to select courses in conformity with the requirements of the General program outlined in § 183.1.3. To receive the B.Sc. General degree, the student must complete at least twelve full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs. Students holding a B.A. General degree wishing to obtain an Honors or Specialization in the Faculty of Science must complete at least fourteen full-session courses or the equivalent and meet the requirements of the four-year program as specified by the Department in which the student is majoring. The student must complete at least fifteen full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs.

Students wishing to obtain a B.Sc. after a four-year B.A. must consult the Dean.

Requirements for B.Sc. after Engineering or Commerce Degrees. The requirements are basically identical to those for a B.Sc. after B.Ed.

183.1.6 TRANSFERS BETWEEN PROGRAMS

A student may transfer from an Honors Program to either the corresponding Specialization Program or to the General Program, or from a Specialization Program to the General Program at any time, by submitting a re-enrollment form to the Faculty Office. Transfers from

the General Program to a Specialization Program or an Honors Program or from one Specialization Program to another or an Honors Program may be made in the same way, subject to deficiencies resulting from requirements of the new program. In addition, transfers to Honors and Specialization Programs require approval of the Department responsible for the new program.

183.1.7 OPTIONS

The term "option", where it appears in the programs, means a course chosen by the student from offerings by the Faculties of Arts and Science, provided he has the necessary prerequisites. An "approved option" in an Honors or Specialization program is an option approved by the Department directing the student's program. An "approved option" in the General program is a course approved by the Dean taken from Faculties other than Arts and Science.

183.1.8 APPEALS AND GRIEVANCES

A student seeking review of a decision affecting academic standing should consult the Dean. Appeals may be heard by the Council of the Faculty. If such appeal is unsuccessful, the student has the right of appeal to the G.F.C. Academic Appeals Committee. (See also § 16.7 of the University Regulations and Information for Students Calendar.)

183.2 Biochemistry

183.2.1 HONORS IN BIOCHEMISTRY

Admission into and promotion to the sequent year of the Honors Program in Biochemistry requires a minimum Grade Point Average of 6.5.

First Year: Chemistry 202; Chemistry 250 or 350; Mathematics 202 or 203 and 204; Biology 130 or 297 and 299 or Microbiology 315; a junior course in English.

Second Year: Biochemistry 300; Chemistry 370; Physics 212 or 240; Mathematics 302 and 303; an Arts option (German, Russian or French suggested).

Third Year: Two senior single-term courses in Biochemistry; Chemistry 312; a suitable Course in Genetics, Microbiology or other biological subject; Physics 340, 301/303 or 401/403; an Arts option.

Fourth Year: Biochemistry 501; two senior single-term courses in Biochemistry; Chemistry 450; two approved options. Recommended options for fourth year include Biometrics 500 and offerings from the Departments of Chemistry, Microbiology, Genetics, Pharmacology and Computing Science.

In the Honors program in Biochemistry opportunity will be given, in the choice of options, for concentration in various areas of Biochemistry.

183.2.2 SPECIALIZATION IN BIOCHEMISTRY

First Year: Chemistry 202; Chemistry 250 or 350; Mathematics 202 or 203 and 204; Biology 130 or 297; English 200 or 210.

Second Year: Biochemistry 300, Chemistry 370; Physics 212, or 203, or 205 and 207, or 209, or 240; a Science option; an Arts option.

Third Year: Microbiology 412 and 432; Chemistry 312; an option in a Biological Science; an option in a Physical Science or Mathematics; an Arts option.

Fourth Year: Two senior single-term courses in Biochemistry; three Science options; an option.

Students are urged to consult with the Department of Biochemistry regarding the selection of options throughout the course of the program.

183.3 Biology

Students who choose Biology as a subject of concentration are advised to consult with the office of one of the departments of Botany, Entomology, Genetics, Microbiology, Zoology or the Dean of Science.

For a principal subject of concentration in Biology, the minimum requirement is four full-session courses from offerings titled Biology (except Biology 210), Botany, Entomology (except Entomology 209), Genetics, Microbiology, Physiology and Zoology. If the principal area of concentration includes two or more half-session courses titled other than Biology, at least two of these courses must be from the same department, e.g. Botany. In addition, at least two of the four full-session courses must be at the senior level.

For a second subject of concentration in Biology, the minimum requirement is three full-session courses from offerings titled as for the principal subject. If the second subject of concentration includes two or more half-session courses titled other than Biology, at least two of these courses must be from the same department, e.g Zoology. In addition, at least one of the three full-session courses must be at the senior level.

Students who take a principal or second subject of concentration in Biology cannot include any courses to meet the requirements that are from a department which is used for either a second or principal subject of concentration, e.g. Genetics courses cannot be used in a principal or second subject of concentration in Biology if the second or principal subject of concentration is in Genetics.

There are three groups of biology courses:

(a) The first group (Biology 130 and Biology 210) are courses without prerequisites. Biology 130 provides an advanced equivalent of Biology 30, and serves the same purpose, as a prerequisite to biology courses listed in other groups. Biology 210 is a course designed to give an insight into biological problems as they affect man. It may be paired with Entomology 209, to provide a full course in biology for students in any faculty who are not specializing or concentrating in a biological field. Biology 210 does not provide a prerequisite to further biology courses.

(b) The second group (Biology 296, 297, 298, 299, 301, 302) comprises the Introductory Biology Program (IBP), for students entering university with high school Biology 30, or its equivalent. The Introductory Biology Program permits study to be made of some or all of six major areas of biology. These are the varieties of living things and their evolution (Biology 296), the mechanisms of heredity (Biology 297), the relationships of organisms to their environments (Biology 298), the physiology of plants and animals (Biology 299), the structure and function of the cell (Biology 301), and the processes of development and growth (Biology 302). These courses provide, in their various combinations, entry to more advanced courses in Biology, Botany, Genetics, Microbiology, Zoology and courses of other faculties. Unless faculties lay down specific requirements within the IBP, the choice of subjects lies with the student; who may decide what areas to explore and what single-term courses should be taken to do this.

Students who intend to take Biology 301, should take Chemistry 250 as a prerequisite. It is strongly

recommended that Biology 301 precede Biology 302 (Developmental Biology).

Honors students in Botany and Zoology are required to complete all six single-term courses of the IBP. This should be done in the first two years at university.

Advice about the Introductory Biology Program may be obtained from the Introductory Biology Program office, the office of the Dean of Science, or the departmental offices of Botany, Genetics, Microbiology and Zoology. Students in Faculties other than Science should consult their advisers.

(c) The third group of Biology courses are those numbered 415, 420, 445, 507, 584, 585, 620. These are advanced courses in subjects of wide biological interest. All have prerequisites.

183.4 Botany

183.4.1 HONORS IN BOTANY

The Honors program provides a comprehensive training and is the most desirable route for students intending to proceed to higher degrees and a research or academic career in this subject.

First Year: 200 level English course (if a single-term 200 level course is selected, then a single-term Arts option is required): Chemistry 200 or 202; Mathematics 202 (or 203) and 204; and one of Biology 296, 297, 298, 299; an approved science option (students are encouraged to take Chemistry 250, Geology 202 and 203; Mathematics 221 and 222; Physics 203 or 205 and Physics 207 or 209).

*Students lacking Biology 30 are required to take Biology 130. They should endeavour to take all four of Biology 296, 297, 298 and 299 during the first year, if possible.

Second Year: Remainder of Biology 296, 298 or 299; Biology 301 and 302; Chemistry 250 or 350; Botany 301 and 302 and the equivalent of a full-session course in an Arts option.

*Students who take Biology 130 will not be required to take Biology 296.

Third and Fourth Years: Students are required to take the equivalent of one full-session course in each of the following areas: Plant Ecology (Botany 322 or 431 and one of Botany 322, 332, 341, 408, 410, 422, 431, 480 or an approved 500 level course). Plant Morphology (Botany 309, and one of Botany 331, 332, 341, 360, 379, 460 or an approved 500 level course). Plant Physiology (Botany 324 and 325), and Plant Taxonomy (Botany 302 or 314 and one of Botany 331, 332, 341, 360, 460 or an approved 500 level course). Botany 400 or 401 and 402 or a single-term senior/full-session equivalent science option; a senior course in Botany; a single-term senior course in Genetics (Genetics 370, 375, 380 or 481 recommended); the equivalent of one and one-half full-session senior courses in another Biological Science; the equivalent of one full-session senior course in Arts and one full-session senior course in open options*. Botany 403 and one from alternate required courses or Botany 304, 342, 379, 414, 421, 450 or 451 are suggested. Students are expected to attend the weekly Departmental Seminars.

*Students intending to proceed to higher degrees and a research or academic career are encouraged to take as one of their options, Russian 210, German 210, French 100, 200 or 205 and 206 in which case, a total of eight instead of seven full-session junior courses are permitted in the program. The following 300 or 400 level Biological Science or open options are suggested: ANTHR 488, 494, 498; BIOCH 300; BIOL 415, 445; CART 341; CHEM 312, 370; CMPUT 300, 351; FOR 314, 450; GEOG 333, 336, 433, 465; GEOL 310, 320, 380, 414, 420, 421, 482, 484; MA SC 420, 430, 435; METEO 307, 320, 412; MICRB 315, 365, 411, 413, 490; PHYS 313, 319; PL SC 380, 385, 431, 432; SOILS 302, 310, 330, 430, 480; STAT 337; ZOOL 325, 350, 421, 430, 435, 451, 463, 464, 466.

A minimum of six and one-half full-session or equivalent courses in Botany must be taken in the Honors program.

It should be noted that not every single-term course is offered every year.

Students intending to enter the Honors program in Botany must have a grade point average of 6 or better, and must maintain this to continue and must consult the Department each year for advice and approval of programs.

183.4.2 SPECIALIZATION IN BOTANY

The specialization program in Botany provides the basic training required for employment at the B.Sc. level in industrial, government and university laboratories. Students may be accepted for graduate programs if an appropriate academic standing is obtained. The program is designed so that students have freedom to pursue specialized areas of interest in Botany — as approved by the Department.

First Year: 200 level English course (if a single-term 200 level course is selected, then a single-term Arts option is required); Chemistry 200 or 202, Mathematics 202 or 203 and 204; and one of Biology 296, or 297, 298, 299; an approved science option (students are encouraged to take Chemistry 250, Geology 202 and 203, Physics 203 or 205 and Physics 207 or 209).

*Students lacking Biology 30 are required to take Biology 130. They should endeavour to take all four of BIOL 296, 297, 298 and 299 during the first year, if possible.

Second Year: Remaining of Biology 296, 298 or 299; Biology 301 and 302; Chemistry 250 or 350; Botany 301 and 302 and the equivalent of a full session senior course in an Arts option.

*Students who take Biology 130 will not be required to take Biology 296.

Third and Fourth Years: Students are required to take the equivalent of at least four full-session courses in Botany and Botany 401, plus the equivalent of two full-session senior science courses. They are also required to take the equivalent of a full-session senior course in an Arts option, plus the equivalent of two and one-half full-session courses as open options. A language other than English is recommended.*

It should be noted that not every single-term course is offered every year.

*Students should consult 183.4.1 Honors in Botany for suggested courses in Modern Languages, Genetics and other Biological Science or open options.

183.4.3 CONCENTRATION IN BOTANY

Students intending to pursue Botany as far as the General Program curriculum allows, must take Biology 30 (in high school) or 130 and three of Biology 296, 297, 298 or 299. Those students who take Biology 130 will not be required to take Biology 296. They should take Botany 301 and 302. In addition students are required to include in their program the equivalent of one full-session course in each of the following areas: Plant Ecology (Botany 322 or 431 and one of Botany 322, 332, 341, 408, 410 422, 431, 480 or an approved 500 level course), Plant Morphology (Botany 309, and one

of Botany 332, 341, 360, 379, 460 or an approved 500 level course), Plant Physiology (Botany 324 and 325), and Plant Taxonomy (Botany 314 or 302 and one of Botany 331, 332, 341, 360, 460 or an approved 500 level course). Botany 401 may be substituted for any one of the area options.

It should be noted that not every single-term course is offered every year.

183.5 Chemistry

183.5.1 HONORS IN CHEMISTRY

Honors students in chemistry are required to take a core of chemistry and auxiliary courses. The core consists of 7 full chemistry courses, 2 full mathematics courses, 1½ courses in physics and 3 full courses in arts. In addition to the core courses honors students are required to complete at least 6 single-term senior courses in chemistry. Four of these must be selected from Group A and the other two from either Group A or Group B. Finally, the honors student must include 7 single-term options in the third and fourth years of the program. These are normally chosen from offerings within the Faculty of Science. All options must be selected in consultation with the Department of Chemistry. The arts options must include one full course in scientific German or Russian.

To remain in Honors Chemistry, a student must maintain a grade point average of at least 6.5.

First Year: Chemistry 202; Chemistry 250; Physics 242; Mathematics 202 or 203, Mathematics 204; a junior course in English or a half course in English and a half course Arts option.

Second Year: Chemistry 312; Chemistry 331; Chemistry 372; Physics 333; Mathematics 302 Mathematics 303; Arts option.

Third and Fourth Years: Chemistry 431; Chemistry 451; Chemistry 453; Chemistry 471; Chemistry 473, 6 single-term senior chemistry courses, 7 single-term science options, Arts option.

Group A: Chemistry 511, Chemistry, 537, Chemistry 551,555; Chemistry 571, 581; one term in Biochemistry.

Group B: Chemistry 501, 503, 507; Chemistry 513, 515, 517, 519, 521; Chemistry 533, 539; Chemistry 553, 559, 561; Chemistry 573, 575, 585, 587, 589, 591, 593, 595.

The Department of Chemistry may approve variations in the above program upon application.

183.5.2 SPECIALIZATION IN CHEMISTRY

The complete specialization program consists of twenty full-session courses and must include Chemistry 202 or 302, 250 or 350, 312, 331, 372, 431, 451, 453, 471 and 473, Physics 242 and 333, Mathematics 202 or 203, 204, 302 and 303, a junior course in English or a half course in English and a half course Arts option, two Arts options, and 13 single-term approved options. These options are normally chosen from offerings within the Faculty of Science. All options must be selected in consultation with the Department of Chemistry. The honors curriculum can be used as a guide in planning a specialization program.

For graduation with chemistry specialization, an average of 5.5 or better in all chemistry courses must be obtained in addition to obtaining an overall GPA of 5.5.

183.5.3 CONCENTRATION IN CHEMISTRY

Students choosing chemistry as a subject of concentration should recognize the advisability of including mathematics and physics as ancillary subjects in their program. The following sequences are recommended:

Three-course sequence: Chemistry 202, 350 and Chemistry 312 or 330 or 370.

Four-course sequence: Chemistry 202, 350, two of 312, 330 and 370.

Five-course sequence: Chemistry 202, 350, 312, 370 and one of Chemistry 330 or 450.

Students seeking pre-professional and vocational training in Chemistry should consult the Department.

183.5.4 CERTIFICATE OF SPECIALIZATION AFTER A GENERAL DEGREE

All outstanding requirements of the Specialization Degree must be completed with an average of 5.5 or better in all chemistry courses taken after the general degree.

183.5.5 DIPLOMA AFTER A PREVIOUS DEGREE

Students who, after a period of professional employment, wish to update their qualifications may enroll in a special one-year program designed for this purpose. Those who possess at least the three-year general degree or its equivalent, and who complete satisfactorily an approved selection of five full courses, may be awarded a diploma which attests to this improvement in their qualification. All courses must be selected in consultation with the Department.

183.6 Computing Science

183.6.1 HONORS IN COMPUTING SCIENCE

The Honors Program is designed to provide a comprehensive education for students intending to pursue advanced degrees and a research or academic career. Students transferring into the Honors program normally require an average of at least 6.5 in the year of admission. An average grade of at least 6.0 must be maintained every year thereafter.

Each student must obtain departmental guidance in developing a coherent and well balanced program suited to his or her particular interests. All course selections and changes require approval by a departmental advisor. A first year Honors student normally enrolls in Computing Science 214/215, Mathematics 207/208, Mathematics 281/282, Physics 242 and English 210. The course requirements for the Honors Program are as follows:

Computing Science: a minimum of eight full-session courses (or equivalent), which must include Computing Science 214, 215, 316, 321, 322, 364, 365, 414 or 416, 418, 462, 464, and 472, and at least two courses at the 500 level.

Mathematics (see Note A): a minimum of five full-session courses which must include Mathematics 207/208 or 202/204 or 203/204; Mathematics 281/282 or 221/222/328; and Mathematics 307/308 or 302/303.

Faculty of Science: Physics 242 and 340.

Faculty of Arts: a minimum of three full-session courses one of which must be English 210 or equivalent English courses.

NOTE A: Students who do not take Mathematics 207/208, 281/282 and 307/308 may experience difficulty in completing an Honors Program in Computing Science.

NOTE B: The purpose of this program is to prepare students for advanced degrees or academic careers in Computing Science. Courses selected to prepare the student for employment opportunities at the B.Sc. level are not normally accepted. Students with such interests should follow the specialization program outlined in § 183.6.2 below.

183.6.2 SPECIALIZATION IN COMPUTING SCIENCE

The Specialization program is designed to provide an education oriented toward direct employment at the B.Sc. level and will include senior courses relevant to the practical aspects of Computing Science. Students transferring into the Specialization program normally require an average of at least 5.5 in the year of admission which should be maintained every year thereafter.

In consultation with a Department advisor, one of the following programs, consistent with the student's career goals, must be selected. The program should be selected very carefully, since changing from one program to another may necessitate taking additional courses to fulfill the requirements of the new program.

BUSINESS APPLICATION

Computing Science: 214, 215, 314, 315, 316, 321, 322, 412, 414, 417; two of 413, 416, 462.
Mathematics: 202 or 203, 204, 221, 222, 302, 303.
Business: ACCTG 202, 204; FIN 304; MAN EC 323; MGT SC 356, 407; and four of IND R 304, LEG R 310, MAN EC 333, MGT SC 410, ORG T 303, ORG T 305.
Arts: ENGL 210; ECON 201, 202; two one-term options.
Science: two one-term options; four of CMPUT 413, 416, 421, 462, 512, 521, 522, one-term science option.

COMPUTER DESIGN

Computing Science: 214, 215, 314, 315, 316, 321, 322, 412, 413, 416, 462, 512.
Mathematics: 202 or 203, 204, 221, 222, 302, 303, 317, 318.
Electrical Engineering: 355, 356, 470, 471, 487, 570, 577, 588.
Arts: ENGL 210; four one-term options.
Science: PHYS 231, 233, 331; three one-term options.

SCIENTIFIC APPLICATIONS

Computing Science: 214,215, 314, 315, 316, 321, 322, 418; one of 412, 414, 416, 462; three of 419, 500-level topics course, 518, 519, 521, 522, 566.
Mathematics: 202 or 203, 204, 221, 222, 302, 303, 328; four of 401, 402, 405, 406, 416, 425. Although the non-honors sequence of courses is listed students should consider taking the honors sequence (MATH 207, 208, 281, 282, 307, 308) if they intend to take advanced numerical analysis courses (CMPUT 419, 518, 519).
Arts: ENGL 210; four one-term options.
Science: two or more terms of physics (203 or 205, 209) — if Physics 242 is selected, it must be followed by Physics 340; seven one-term options or equivalent in Science and/or Engineering, which must include a 4-term sequence.
Options: two one-term options from any faculty.

SOFTWARE DESIGN

Computing Science: 214, 215, 314 or 364, 315 or 365, 316, 321, 322, 412, 413, 414, 415, 416, 421; two of 417, 462, 464, 465, 472; one of 511, 516, 591; one of 512, 517, 525, 565, 592.
Mathematics: one of 202, 203, 207; 204, 221, 222, 302, 303; one option.
Arts: ENGL 210; four one-term options.
Science: six one-term courses which must include a 4-term sequence.
Options: four one-term options from any faculty.

183.6.3 CONCENTRATION IN COMPUTING SCIENCE

Students planning to take Computing Science as a subject of concentration are encouraged to consult the Department regarding the choice of all courses. A sequence of eight or more one-term courses from the following program is recommended:

Computing Science 214/215 (or 351/352), 314, 315; and four of 316, 321, 322, 412, 413, 414, 416, 417, 418, 462, 463, 464.

NOTE: Some of these courses have Mathematics co-requisites and prerequisite.

183.7 Entomology

183.7.1 HONORS IN ENTOMOLOGY

The four year Honors program provides B.Sc. students with comprehensive training in the Biological Sciences and Entomology in particular. Graduates of this program should be capable of proceeding to higher degrees in the Biological Sciences. In addition to the following requirements, students are referred to § 183.1.1 of this calendar.

The first year program must include the university equivalent of any one of Biology 30, Chemistry 30 and Physics 30 not taken in high school. Other courses required during the program include Chemistry 250 or 350; Physics 205 and 207 or 209; Zoology 325/326 and 352/353; Botany 301 and 302; Statistics 337; Entomology 302, 317, 419, and one or more of 392, 401, 427, 450, 471, 476, 480, 492, 527, 556, 560, 561; Genetics 351 or Biology 297; Biochemistry 300 or Plant Science 431 and 432; Forest Science 380; an approved language and two Arts options. Recommended electives include Geology 201 and 305. Microbiology 360, Statistics 255 or Plant Science 500, and senior Botany, Genetics, and Zoology courses.

An overall G.P.A. of 6.5 must be maintained each year to remain in the Entomology Honors program.

Students planning to take honors in Entomology should consult the Department. Each honors student will be assigned a faculty advisor.

In addition to the calendar requirements, other courses may be required by the advisor. Each honors student will also be required to pass a comprehensive oral or written examination by selected faculty members within the final term.

183.7.2 SPECIALIZATION IN ENTOMOLOGY

The four year specialization program provides B.Sc. graduates with an extensive training in Entomology. In addition to the following requirements, students are referred to § 183.1.2 of this calendar.

The first-year program must include the university equivalent of any one of Biology 30, Chemistry 30, and Physics 30 not taken in high school. Other courses required during the program include Chemistry 200 and either 250 or 350; Physics 205 and 207 or 209; Zoology 352, 353; Botany 301 and 302; Entomology

302, 317, 419, and one or more of 392, 401, 419, 427, 450, 471, 476, 480, 492, 527, 556, 560, 561; Genetics 351 or Biology 297; Forest Science 380; and two Arts options. Recommended electives include Geology 201 and 305, Microbiology 360, Statistics 255 or Plant Science 500, Computing Science 214 and 215 or 351/352, and senior Botany, Genetics, and Zoology courses.

183.7.3 CONCENTRATION IN ENTOMOLOGY

Students may become acquainted with the subject by taking Entomology 302 and Zoology 352/353; they should have high school Biology 30 or the equivalent at university before doing this. Students contemplating concentration in Entomology should consult the Department. A good background in science and especially in biology is a necessary preliminary.

183.8 Genetics

183.8.1 HONORS IN GENETICS

A student entering the Honors program must confer with the Honors Student Committee of the Department of Genetics as soon as possible each year before registration in order to plan a program. The program may be varied in consultation with the Committee.

First Year: Biology 296, 297, 298, 299; Chemistry 250; Mathematics 202/204 (Mathematics 207/208); Arts option.

Students may also enter the Honors program by taking Genetics 351 in the second year (as the equivalent of Biology 297 and Genetics 375).

Second Year: Biology 301; Microbiology 315; Genetics 370, 375 and 380; Chemistry 302; Biochemistry 300; a single-term Arts option.

The Third and Fourth years will provide students with the flexibility of pursuing their particular interests. The program consists of a core of courses and a number of appproved options.

The core will consist of:

(a) Four of the following five single-term genetics courses: 415, 430, 445, 465 and 486;
(b) An approved single-term statistics or mathematics course;
(c) Three single-term Arts options;
(d) One single-term option.

Students will choose the remainder of their courses in accordance with one of the following two programs:

Program 1
— Genetics 520 or 521
— Two single-term genetics courses.
— Seven approved single-term Science courses.

Program 2
— Genetics 481
— Two single-term genetics courses including Genetics 465 if not taken previously.
— Three additional single-term courses in mathematics, statistics, computing science.
— Four approved single-term Science options.
— One sigle-term option.

The result of a comprehensive examination will weigh heavily in determining the class of degree conferred.

Students in the Honors program are encouraged to make contact with faculty and graduate students as soon as possible.

A grade-point average of 6.0 is required to enter the Honors program and to continue in the program.

183.8.2 SPECIALIZATION IN GENETICS

This program is intended to provide more flexibility than is available in the Honors program. Students must consult the Honors Committee as soon as possible each year before registration to plan their program to ensure that it will provide the qualifications they are seeking.

First and Second years: Approximately as in the program for Honors in Genetics.

Third and Fourth Years: At least five single-term courses in Genetics and at least five single-term courses or the equivalent in biological sciences and Biochemistry; one and a half Arts options; three and a half options.

183.8.3 CONCENTRATION IN GENETICS

Students planning to take Genetics as a subject of concentration are advised to consult the Department as early as possible regarding the choice of their courses. Students are advised to include Mathematics 240 and Statistics 241 or Mathematics 202 and 204 or 203 and 204, or 221 and 328, Chemistry 250, Biology 296, 298 and 299 and Biology 297 or Genetics 351 in the first two years of their program. These provide full opportunity to enter most of the courses offered.

A general program student with a three- or four-course concentration in Genetics can undertake graduate work only by spending a year as a special student after taking a B.Sc. An undergraduate in the general program who decides to do graduate work in Genetics should consult the Department for advice on the best combination of courses in the final years of the general program.

183.9 Geography

183.9.1 HONORS IN GEOGRAPHY

The Department of Geography offers both the B.A. and the B.Sc. degrees with Honors in Geography. Students wishing to stress the humanities and social sciences should register in the B.A. program; those who wish to stress the physical and biological sciences should register in the B.Sc. program.

An undergraduate may elect to read for Honors in Geography either at the beginning of the first year or after satisfactory completion of one or two years of the General B.A. or B.Sc. degree course. In any case the Chairman of the Department or the Department's Honors Advisors must be consulted first. The required grade-point average to enter and to continue in the Honors program is 6.5. Information on the departmental requirements that must be satisfied to achieve First Class Honors can be obtained from the Department of Geography.

NOTE: In the following course program, the term, "option" means either one full-session course or two single-term courses.

First Year: Any two of Geography 230, 231, 250 or 251; Statistics 241 or 255; two approved Science options; one approved Arts option.

Second Year: The remaining two courses from Geography 230, 231, 250 and 251; Geography 329, 429 Cartography 341; one senior level science option in Geography; one approved Science option in a field other than Geography.

NOTE: For purposes of this requirement, Meteorology is regarded as a separate field of study.

Third Year: One senior Science option in Geography; one senior systematic Arts option in Geography; one approved Science option in a field other than Geography.

Fourth Year: Geography 498; one senior single-term course in Geography; one senior Science option in Geography; one approved Science option; two approved options.

NOTE: Students may present a thesis in place of the senior science option in Geography. They should register in Geography 553 (0-6s-0).

During the fourth year a candidate for Honors will be required to take an oral examination in the field of Geography.

The program must include one senior regional course in Geography. A list is available from the Department of Geography.

183.9.2 SPECIALIZATION IN GEOGRAPHY

The four-year specialized degree is designed for those students who do not desire the full training of an Honors degree, but who wish to specialize in some branch of Geography. It is also intended to provide an opportunity for considerable course work in a field closely related to the specialization within Geography. It is not normally viewed as a fit preparation for graduate work in Geography, though students with a four-year specialized degree *may* be admitted as Category B graduate students at The University of Alberta.

NOTE: In the following course program, the term course means either a full-session course or two single-term courses.

The program must include the following:

(i) A minimum of twelve courses in Science.

(ii) At least five and not more than eight courses in Geography.

(iii) Not more than two 200-level courses in Geography (the majority of the remaining Geography courses must be in Science).

(iv) A second subject of concentration. It may be taken in any department in the Faculties of Arts and of Science, including the Cartography and Meteorology offerings of the Department of Geography. It must contain at least four and not more than five courses.

(v) The following courses: Geography 230/231, 329/429 and any two of the following; Geography 336, 340, 341, 361, 382, 445, 446 and 449.
NOTE:Cartography 341 may be substituted for Geography 329/429 by students who are *not* taking Cartography as their second subject of concentration. Students who take Cartography 341 in place of Geography 329/429 may take only seven courses designated in the Calendar as Geography.

(vi) A minimum of three non-Geography courses in the Faculty of Arts.

Advice on specialization streams within Geography and related fields is available from the Department. All programs must be approved by the Science student advisor in the Department of Geography.

183.9.3 SPECIALIZATION IN GEOGRAPHY (SURVEY SCIENCE)

This four-year program is designed to provide a basic education for students who are preparing themselves for certification as professional surveyors. It is integrated with the professional examination syllabus of the Alberta Land Surveyors' Association.

Advice on course selection must be obtained from the Department of Geography but the following core courses have to be included: Geography 230/231, 250/251, 482/488, 501; Cartography 341, 451; Mathematics 212/213 (or 202/204), 312/313 (or 317/318); Statistics 335; Physics 240 (or 231/233), 340; Computing Science 351, 352, 458; Civil Engineering 350, 450, 550, 551, 552, 553; Law 403. Successful completion of Law 403 will exempt a student from the level III examination requirements of the Alberta Land Surveyors relating to Laws on Real Property.

183.9.4 SPECIALIZATION IN GEOGRAPHY (METEOROLOGY)

The Department of Geography offers a four-year program which meets the educational prerequisites for students who are preparing for a career as a meteorologist.

Mandatory course requirements are:

Mathematics: one and one half courses in calculus, one-half course in differential equations, one-half course in linear algebra, one-half course in statistics, one-half course in numerical analysis or matrix algebra or computer systems.

Computing Science: one full course or the equivalent.

Physics: Physics 242, 311, 343, 382, plus two half-year courses from advanced mechanics, optics, applied physics, fluid mechanics, or modern physics.

Meteorology: Meterology 406, 407, 412, 511, 512, 516, 307 and two of Meteorology 517 or Geography 334, 433 or 533.

Arts options: One full English course or the equivalent and two additional full-courses or the equivalent.

Note that Mathematics 302/303 or 307/308 are prerequisites or corequisites for Physics 311/343 and Meterology 406/407.

183.9.5 CONCENTRATION IN GEOGRAPHY

All students are advised to include Geography 230, 231, 250 and 251 in their programs. Those in a five or six course sequence should add either Geography 329, 429 and/or Cartography 341, and one of the Canadian or North American regional courses.

NOTE: Descriptions of Geography 250 and 251 and other courses considered as Social Sciences will be found in the Faculty of Arts section of this calendar.

Students interested in graduate work in Geography should consult the Department.

183.10 Geology

Geologists are employed by companies engaged in exploration for and production of minerals and fuels; by government agencies such as the Alberta Research Council, Alberta Department of Energy and Natural Resources, Alberta Department of the Environment, Alberta Energy Resources Conservation Board and the Geological Survey of Canada; by companies engaged in the construction of major engineering projects; and by universities. They work in cities and in remote uninhabited regions, in the laboratory and in the office, and in the deserts and jungles of developing countries. Canada, a country dependent on its vast natural resources, requires the geologist's skills for the maintenance of the economy. A world facing crises in the supply of energy-giving fuels and metals will depend increasingly on the geologist for guidance in finding new

supplies. Mankind facing progressive deterioration of the environment requires the geologist's knowledge of the earth to maintain the quality of life.

183.10.1 HONORS IN GEOLOGY

The Honors program educates students in all the major geological sciences and is designed to prepare them for graduate work or a career in Geology immediately upon graduation. Required courses impart a substantive core of geological knowledge together with such background in other sciences as is required for the proper understanding of the subject. Some specialization is allowed, particularly in the fourth year. Except by special permission of the Department, students enrolled in the program should take the courses listed below, although not necessarily in the same order, and obtain a grade-point average of 6.5 calculated over the last two years. For First Class Honors an average of 7.5 is required.

First Year: Geology 202 and 203; Chemistry 202; Mathematics 202 or 203 and Mathematics 204; Physics 205 and 209; two single-term Arts courses (English recommended).

Second Year: Geology 309, 310, 320, 330, 331, 362 and 380; Computing Science 351; approved Science option (Physics 207 recommended); two single-term Arts courses.

Third Year: Geology 409, 420, 421, 445, 446, 452, 460; Geophysics 327, 329; one or two approved options (Geology 430 and Arts course recommended).

Fourth Year: Geology 447, 507 and/or 508, 570, 580; five or six approved options (Geology 482, 523, 532, 547 and Arts course recommended).

183.10.2 HONORS IN GEOLOGY AND ZOOLOGY

The Honors program in Geology and Zoology is intended to prepare students, especially those with an interest in Paleontology, for either graduate work or a career in Geology or Zoology. Students should be prepared to follow the guidelines below, and are required to obtain a grade-point average of 6.5 calculated over the last two years. For First Class Honors, an average of 7.5 is required. In addition students are required to take an oral examination on stratigraphic and biological principles in the fall of the fourth year.

First Year: Biology 296, 297, 298, 299; Chemistry 200 or 250; Geology 202 and 203; two single-term Arts courses (English recommended).

Second Year: Geology 310, 320, 362; Zoology 304, 305, 352, 353; Mathematics 202; two single-term Arts courses (Anthropology 390 strongly recommended).

Third Year: Geology 414 or Paleontology 514; Geology 330, 420, 421; Zoology 460, 498; two Arts and two approved (Geology 331 strongly recommended) single-term courses.

Fourth Year: Zoology 501 or two of Geology 500, 507, 508, Zoology 520; Paleontology 514 or Geology 414; Paleontology 418, 419; five approved single-term courses (Geology 580 strongly recommended).

183.10.3 SPECIALIZATION IN GEOLOGY

The Specialization program educates students in most of the major geological sciences and prepares them for a career in Geology or, providing the requirements are met, graduate work. Required courses impart a core of geological knowledge together with such background in other sciences as is required for the proper understanding of the subject. A certain amount of specialization is allowed, particularly in the fourth year. Except by special permission of the Department, students enrolled in the program should take the courses listed below, although not necessarily in the same order. Students are encouraged to take six single-term courses in a subject of concentration other than Geology; a senior course in this subject may, under certain circumstances, be substituted for one of the required listed below.

First Year: Geology 202 and 203; Chemistry 200 or 202; Mathematics 202 or 203 and Mathematics 204; Physics 205 and 209 or Physics 242; two single-term Arts courses (English recommended).

Second Year: Geology 309, 310, 320, 330, 331, 362 and 380; Physics 207 (recommended) or 340; Computing Science 351; one or two approved Arts options.

Third Year: Geology 409, 420, 421, 445, 446, 452, 460, Geophysics 327 and 329; two approved options.

Fourth Year: Geology 447, 570, 580; seven approved options (Geology 482, 523, 532, 547, and Arts course recommended).

183.10.4 CONCENTRATION IN GEOLOGY

Students in the three-year program who are interested in Geology may take the equivalent of three to six full-session courses in this subject. A three-year B.Sc. with a six-course concentration in Geology can serve as a preparation for a professional career if subsequently followed by a fourth year. Students enrolled in the three-year program may transfer to the four-year program at the end of the first, or, in most cases, at the end of the second or third years. Recommended Geology courses include 202 and 203 , 309, 310, 320, 330, 331, 362, 380, 409, 420, 421, 445, 446 and 460.

183.11 Geophysics

The Department of Physics offers two programs dealing with solid earth physics and space physics. The Honors in Geophysics program is designed to prepare students for careers in graduate work in geophysics and is described in § 183.17.3. The Specialization in Geophysics program is designed to prepare students with the conceptual and laboratory background required for employment at the B.Sc. level in industry, government and technical schools, and is described in § 183.17.6.

183.12 Linguistics

183.12.1 HONORS IN LINGUISTICS

The Department of Linguistics offers both the B.Sc. and B.A. degrees with Honors in Linguistics. Students wishing to emphasize the humanities should register for the B.A. The B.Sc. Honors in Linguistics emphasizes the scientific investigation of human language and requires, in addition to courses in Linguistics, supporting courses in related scientific fields.

First Year: There are no Honors program courses in Linguistics for first-year students. A student wishing to begin an Honors program in Linguistics should consult the Department well before the end of the first year. However, all students accepted into Honors Linguistics must pass the following courses or their equivalents: Biology 296 and 299; Mathematics 202 and 204; Psychology 260. In addition, Physics 205/209 or 212 is strongly recommended.

Second Year: Linguistics 303, 304, 307, 308, Psychology 309; Arts option: approved options.

Third Year: Linguistics 407, 409, 410; Computing Science 351; Psychology 360; either Physiology 403 or Psychology 362; Arts option: approved options.

Fourth Year: Linguistics 511, 512, 521, 522; two of the following — Psychology 366, 465, Mathematics 331, or Physiology 503; Arts option; approved option.

Honors students will arrange with their departmental supervisors for approved options in related fields, depending on the student's special interests. In addition, every Honors student must take two full courses in a language other than English. This requirement may be subsumed under the Arts options required by the Faculty of Science.

A GPA of 6.0 must be maintained to enter and continue in Honors in Linguistics and to graduate with Honors in Linguistics. A GPA of 7.5 on all courses taken in the last two years of the program must be achieved to graduate with First Class Honors in Linguistics.

183.12.2 SPECIALIZATION IN LINGUISTICS

This program is designed to give the student a broader background in Linguistics than the General Degree. If satisfactory standing is maintained, it should prepare the student for application to graduate school in Linguistics. The program consists of twenty full-session courses which should include the following, and should be arranged in consultation with the Department of Linguistics:

(1) at least five full-session courses in Linguistics, chosen in consultation with the Department;

(2) at least four full-session courses in a minor field of concentration, chosen in consultation with the Department;

(3) Two full courses in a language other than English;

(4) Psychology 309.

183.12.3 CONCENTRATION IN LINGUISTICS

A student who wishes to elect Linguistics as a subject of concentration in the General program in the Faculty of Science should consult with the Department on an appropriate selection of courses in Linguistics. In all cases, Linguistics 303 will be a prerequisite to subsequent linguistics courses and Linguistics 409/410 should be included in the program.

183.13 Mathematics

183.13.1 HONORS IN MATHEMATICS

The honors program is an intellectually rewarding one. It is intended for students who have a high level of ability and interest in mathematics. It is also designed to be flexible, so that a student can use the options in the program to prepare for a wide variety of careers.

The program consists of twenty full-session courses. There are three degree possibilities.

COMMON PROGRAM

First Year: Mathematics 207/208, Mathematics 281/282, one Science option, one Arts option, one option.

Second Year: Mathematics 307/308, Mathematics 381, one term Mathematics option, three options.

Third and Fourth Years: Mathematics 405/406, Mathematics 495, Mathematics 442/443, seven options.

Some of the options in the full program are determined by the choice of degree.

HONORS IN MATHEMATICS

This is the traditional honors mathematics program. In addition to the common program, this degree must include Mathematics 425 and Mathematics 409/410.

HONORS IN APPLIED MATHEMATICS

This is a flexible honors program designed for students who are interested in the applications of mathematics. At least three approved courses of an applied nature in one distinct field must be taken at the 400 level or above. Some examples of fields of applications are Economics, Statistics, Computing Science, Physics, and Biology. A student should plan carefully so that the proper prerequisites are taken early in the program. In addition, the degree must include at least two single-term courses selected from Mathematics 431, 432, 436, 437; Statistics 465, 466, 471, 472.

HONORS IN MATHEMATICAL STATISTICS

This is the traditional honors program for those students interested in mathematics and statistics. In addition to the common program this degree must include Mathematics 409/410; Statistics 365/366, 471, 468, 465, 466, and one 500 level Statistics course.

MINOR IN COMPUTING SCIENCE

Any of the honors degrees above may be obtained with a minor in Computing Science provided the students' program includes a minimum of ten half-courses which must include Computing Science 214, 215, 364, 365, 418, 472, and at least two of 419, 505, 566, 571, 572, with a grade-point average of at least 6.0 in all these courses.

Students are advised to consult the Department as soon as possible for specific suggestions on options in a program.

Each program must be approved by the Honors Committee of the Department. Each program is subject to the requirements of the Faculty: at least 12 full-session courses in the Faculty of Science, at least 3 full-session courses in the Faculty of Arts, and no more than 7 junior (200 level) courses. For Faculty requirements see § 183.1.1.

The Department also offers a B.A. Honors in Mathematics (See § 43.15.1).

183.13.2 SPECIALIZATION IN MATHEMATICS

This program is intended for students who are interested in mathematics but do not want to take as many high level mathematics courses as is required in the honors program. With the proper choice of options it can lead to a wide variety of careers.

The program consists of twenty full-session courses, at least 8 of which must be courses offered by the Mathematics Department.

First Year: Mathematics 202/204, Mathematics 221/222, Computing Science 214/215, one Arts option, one option.

Second Year: Mathematics 302/303; two of Mathematics 321/328, Mathematics 341,342, Statistics 365/366, Computing Science 314/315; two options.

Third Year: Five options.

Fourth Year: Five options.

By the end of the second year, the student chooses an area of concentration, and that choice will govern many of the options in the program. For example, a student choosing to concentrate in traditional Applied

Mathematics must include upper level courses in Mathematics, Physics or Engineering. Among other possible concentrations are Actuarial Science, Economics, Computing Science, Statistics, and Education. A custom program can be designed for virtually any career interest. The student is advised to consult the Department as soon as possible regarding program recommendations.

Each program must be approved by the Specialization Committee of the Department. Each program is subject to the requirements of the Faculty: at least 12 full-session courses in the Faculty of Science, at least 3 full-session courses in the Faculty of Arts, and no more than 7 junior (200 level) courses. For Faculty requirements see § 183.1.2.

The Department also offers a B.A. Specialization in Mathematics (see § 43.15.2).

NOTE: Mathematics 203 is equivalent to 202. The corresponding Honors course can be substituted for a course listed. For example, Mathematics 207 can be substituted for 202.

183.13.3 ECONOMICS AND MATHEMATICS

The Faculty of Science offers both an honors degree and a specialization degree in Economics and Mathematics.

HONORS IN ECONOMICS AND MATHEMATICS

First Year: ECON 201-202, MATH 207-208, MATH 281-282, one junior English course, one Science option.

Second Year: ECON 381-382, MATH 307-308, STAT 365-366, one Science option, one option.

Third and Fourth Years: Four Economics courses, two Mathematics or Statistics courses, 2½ Science options, 1½ options.

The program must contain MATH 381/382 and ECON 481/482. One full year course in Computing Science is recommended.

SPECIALIZATION IN ECONOMICS AND MATHEMATICS

First Year: ECON 201-202, MATH 202-204, MATH 221-222, one junior English course, one Science option.

Second Year: ECON 381-382, MATH 302-303, STAT 365-366, one Science option, one option.

Third and Fourth Years: Ten options.

The program must contain at least six full-year courses in Economics, at least six full-year courses in Mathematics and one full-year course in Computing Science.

Each program must have approval of the Departments of Economics and Mathematics and must contain a minimum of 10½ courses in Science.

183.13.4 CONCENTRATION IN MATHEMATICS

Students in the three year degree program who are interested in Mathematics should follow the first three years recommended for Specialization in Mathematics. This gives the student flexibility in switching from one program to the other. It also increases the number of career possibilities after graduation. Students should consult the Department as soon as possible regarding the choice of their courses.

183.14 Meteorology

183.14.1 SPECIALIZATION IN METEOROLOGY

See § 183.9.4.

183.14.2 CONCENTRATION IN METEOROLOGY

The Department of Geography offers instruction in Meteorology, Cartography and Climatology. Courses in Climatology are listed under "Geography" in § 184.12, below.

Students interested in Meteorology as a subject of concentration should elect the undergraduate courses offered, and acquire a good background in Physics and Mathematics. Supplementary studies in the Earth Sciences, Statistics, and related fields are also recommended.

183.15 Microbiology

183.15.1 HONORS IN MICROBIOLOGY

The Honors program in Microbiology is designed to provide students in the first two years of study with an understanding of the physical-chemical sciences which will permit them to specialize in the various areas of Microbiology in their third and fourth years. A G.P.A. of at least 7.0 and a departmental recommendation is required for entry into and for annual promotion within the program.

During the fourth year all Honors candidates are required to carry out a directed study (Microbiology 503, 504 or 505), under the supervision of a staff member. The problem will be related to the special interests of the student and will involve a literature report as well as some experimental work on the part of the student. A written report and an oral presentation of his or her results to the staff and other students is required.

First Year: Biology 297; Chemistry 250 Microbiology 315; Chemistry 200 or 202; Mathematics 202 or 203 and 204; Arts option.

Second Year: Biochemistry 300; Microbiology 368 and 370; single-term Genetics course; Physics 203 or 205; two single-term Science options; Arts option.

Third Year: Chemistry 370; Microbiology 411, 413 424 and 444; one single-term Science option; Arts option.

Fourth Year: Chemistry 312; Microbiology 406 and 503 or 504 or 505 and four, three or two single-term Science options.

Approved Options: Bacteriology 361, 425, 505, 506 Biochemistry 511, 512, 521, 531; Botany 341 and 342 Chemistry 451 and 453; Computing Science 351; Food Science 461, 462, 502, 566; Foods and Nutrition 510 Genetics 365, 370; Interdisciplinary 505; Microbiology 401, 403, 405, 432, 490, 515; Pharmacy 481 and 484 Soil Science 430.

NOTE: Other courses offered by the above departments may be accepted as approved options. Consult Department for courses not listed.

183.15.2 SPECIALIZATION IN MICROBIOLOGY

This four-year program is designed to provide the student with a maximum degree of flexibility in the choice of courses ancillary to the basic require-

science program. The program provides the basic training required for employment at the B.Sc. level in industrial, government and university laboratories as well as providing the training required for entry into graduate programs.

First Year: Biology 297; Chemistry 200 or 202 and 250; three single-term Science courses; Arts options to a total of five full-session courses.

Second Year: Biochemistry 300; Microbiology 315 and 365; Mathematics 202 or 203 and 204 or Mathematics 240 and 245; Physics 203 or 205; Arts options; approved Science options to a total of five full-term courses.

Third Year: Microbiology 411, 413; one single-term Genetics course; Arts option; approved Science options to a total of five full-term courses.

Fourth Year: Chemistry 312; equivalent of four full-term Science courses.

Approved Options: Bacteriology 361, 425, 505, 506; Biochemistry 511, 512, 521, 531; Botany 341 and 342; Chemistry 451 and 453; Computing Science 351; Food Science 461, 462, 502, 566; Foods and Nutrition 510; Genetics 365, 370; Interdisciplinary 505; Microbiology 401, 403, 405, 424, 432, 444, 490, 495, 496, 497 and 515; Pharmacy 481, 484; Soil Science 430.

NOTE A: Students who have questions about either of these programs or who wish to transfer into them from other patterns are requested to contact the Department of Microbiology.

NOTE B: Other courses offered by the above departments may be accepted as approved options. Consult Department for courses not listed.

NOTE C: A student must receive a grade of not less than 6.0 in the following courses: Microbiology 315, 365, 411 and Biochemistry 300.

183.15.3 CONCENTRATION IN MICROBIOLOGY

Students considering Microbiology as a possible subject of concentration are advised that Microbiology 315 and 365 serve as an introduction to courses in Microbiology given in this and other Departments. Chemistry 200 and 250 should be taken in the first year, so that Biochemistry 300 and Microbiology 315 and 365 may be taken in the second year.

183.16 Pharmacology

183.16.1 HONORS IN PHARMACOLOGY

The program leading to the degree of B.Sc. with Honors in Pharmacology is offered by the Department of Pharmacology (Faculty of Medicine). The program is designed to prepare students for advanced study in Pharmacology or in a closely related scientific field, leading to an academic and/or a research career. However, because no courses in Pharmacology are offered until the students are in their third year of study, *all* students are required to register for "Specialization in Pharmacology" (§ 183.16.2) for the first three years of the program.

At the end of their third year, students with a G.P.A. of at least 6.5 in each of the first three years of the program may request a transfer to the Honors program, provided that the courses they have taken and the standing attained are satisfactory. However, a grade of at least 7 in each of the following required areas of concentration is required before the student will be given departmental approval to transfer to the Honors program:

Pharmacology 432; Pharmacology 435 and/or Pharmacology 436 and Physiology 410.

A student considering the Honors program must consult the Chairman of the Deparment of Pharmacology (or his/her designee) concerning his/her eligibility and the selection of course options throughout the program. Students in the Honors program must take at least five full-session courses during the winter session of each year of the program. Each Honors student's program must be approved by the Department of Pharmacology.

First Year: As for the program "Specialization in Pharmacology".

Second Year: As for the program "Specialization in Pharmacology".

Third Year: As for the program "Specialization in Pharmacology".

Fourth Year: Pharmacology 498; Pharmacology 499; at least two other single-term senior courses in Pharmacology; plus other approved options preferably in Physiology, Biochemistry or Pharmacy to a total of five full courses for the winter session.

NOTE: Degrees with Honors are awarded in two classes: First Class Honors and Honors.

B.Sc. First Class Honors in Pharmacology is awarded to students who achieve a G.P.A. of at least 7.5 in their third and fourth year, and, in addition, a G.P.A. of at least 8.0 for all courses taken in the Department of Pharmacology.

B.Sc. Honors in Pharmacology is awarded to students who achieve a G.P.A. of at least 6.5 in their fourth year. and, in addition, a G.P.A. of at least 6.5 for all courses taken in the Department of Pharmacology.

A student who fails to attain the *G.P.A.'s* necessary for an Honors degree in Pharmacology may be granted the Specialization degree, provided that the standing attained is approved by the Department.

183.16.2 SPECIALIZATION IN PHARMACOLOGY

This program is designed to provide greater flexibility for students who want a four-year degree in Pharmacology without the full comprehensive training of the Honors program. However, because no courses in Pharmacology are offered until the third year of study, *all* students are required to register initially for "Specialization in Pharmacology".

Entry into the third year of the Specialization program requires approval of the Department and a G.P.A. of at least 6.0 over all those courses which are to be credited towards a Degree.

A G.P.A. of at least 6.0 in the third year is required for the entry into the fourth year of the Specialization program. In addition, a grade of at least 6.0 in each of the following required courses must be achieved before a student will be given departmental approval to register in the fourth year of the Specialization program:

Pharmacology 432 and Pharmacology 435 and/or Pharmacology 436.

A student who is not recommended to continue in Specialization at the end of the third year may be granted the General B.Sc. degree forthwith provided that the courses taken and the standing attained are satisfactory.

Specialization students must consult the Chairman of the Department of Pharmacology or his or her designee regarding the selection of options throughout

the program. The required course load during each winter session is at least five full-session courses. In each year, a Specialization student's program must be approved by the Department of Pharmacology.

First Year: Chemistry 202; Chemistry 250; Mathematics 202 or 203; Mathematics 204; two Biology courses from Biology 296, 297, 298, 299 or Biology 130; or other approved Science courses; English 210 (or 200).

Second Year: Chemistry 370; Biochemistry 300; Zoology 341; Microbiology 315/365; plus an approved single-term Science course; an approved Arts option (French 200 or German 200 recommended).

Third Year: Pharmacology 432; Pharmacology 435 and/or Pharmacology 436; Physiology 410; an approved course in Statistics (Psychology 309, Plant Science 500, Statistics 337); an approved Science option; an approved Arts option. Note: A student who has not passed Physics 30 will be required to take Physics 203 and either Physics 207 or 209.

Fourth Year: At least two single-term senior courses in Pharmacology (Pharmacology 501 or 502 recommended); plus other approved Science options to a total of five full courses for the winter session.

B.Sc. Specialization in Pharmacology is awarded to students who achieve a G.P.A. of at least 6.0 in both their third and their fourth year. In addition, a G.P.A. of at least 6.0 for all courses taken in the Department of Pharmacology is required.

183.17 Physics

The Honors Programs offered by the Department of Physics are designed to provide a comprehensive education for students intending to pursue advanced degrees and a research or academic career. Admission into an Honors Program normally requires a grade point average of at least 6.5 in the year of admission and this average must be maintained every year thereafter. A First Class Honors degree is awarded to a student with a grade point average of 7.5 or better in the last two years of the program.

NOTE: Students interested in the Engineering-Physics program should consult § 83.5.4 of the Faculty of Engineering calendar.

183.17.1 HONORS IN PHYSICS

First Year: Physics 242, Mathematics 203/204/221 full year English course (English 210 recommended), one and one-half approved options (recommended are Chemistry 202, Geology 202/203, Computing Science 300, Astronomy 253, Mathematics 222).

NOTE: First-year Engineering or the first year in the general program may be accepted in consultation with the Department.

Second Year: Physics 311, 343, 371, 382, 390; Mathematics 302/303/222 and 431; full year Arts option. (Computing Science 300 if not previously taken).

Third Year: Physics 461, 471, 482, 493, 497; Mathematical Physics 443 and 444; Mathematics 408 and 437; Arts option (one-term).

Fourth Year: Physics 511, 513, 515, 571, 573, 599; either Physics 591 or Mathematical Physics 551; Arts option (one-term); two of Physics 517, 545, 561, 563, 565, 593, Mathematical Physics 467 or 553, and Geophysics 521, 523. Students are also expected to take part in the weekly Physics Colloquium.

183.17.2 HONORS IN GEOPHYSICS

First and second years are the same as the first and second years in the Honors in Physics program except that the Honors Geophysics students must take Geology 202/203 in first year rather than the Science option.

First Year: Same as the Honors in Physics program (§ 183.17.1 above). Students are advised to take Geology 202/203.

Second Year: Same as the Honors in Physics program (§ 183.17.1 above).

Third Year: Geophysics 421, Physics 482, Physics 493/497, Mathematics 408/437, Mathematical Physics 443/467, Approved Geology (Geology 320 recommended).

Fourth Year: Geophysics 521/523, 527/528, Physics 471/approved Physics option (one-term), Geology 460/approved Science option (one-term) Geology 330 recommended, Arts option (full session course or two half courses).

183.17.3 SPECIALIZATION IN PHYSICS

The courses listed below comprise a minimum program. Students may, in consultation with the Department, select more advanced courses in place of those listed. A suitably enriched program can be used for admission to graduate work in Physics provided satisfactory standing is obtained.

First Year: Physics 242; Mathematics 202 (or 203) and 204; Mathematics 221 and Computing Science 300 (or 214 or 351); full year English course; full year approved option (Chemistry 202, Geology 202/203 or Astronomy 253 recommended).

Second Year: Physics 382; 343, 351; Mathematics 302, 303, and 313; Approved Option (full year equivalent); Arts Option (full session course or two half courses).

Third Year: Physics 311, 371, 390; Mathematics 402, 408; Arts Option (full course or two half courses); One and one-half approved options.

Fourth Year: Physics 461, 471, 482, 493, 497; two approved options (full year).

183.17.4 SPECIALIZATION IN GEOPHYSICS

First Year: Physics 242; Mathematics 202/204/221; Geology 202/203; Chemistry 203/205, Single term Arts option (English 275 or 284 recommended).

Second Year: Physics 311/343; Physics 382; Mathematics 313; Mathematics 302/303; Geology 320/330; Computing Science 300 or Geology 331* single-term Arts option (Economics or Political Science recommended).

*Note: Students with an interest in mining should take Geology 331 as a prerequisite to further courses.

Third Year: Physics 371; Geophysics 421, 425, 427; Mathematics 402/408; Physics 390; One of: Geology 460 or Meteorology 406; one of: Computing Science 300, Geology 331, 421, 460; Meteorology 407; single-term Arts option.

Note:

(a) Geology 460 is required for certification as a professional geophysicist in Alberta.

(b) Computing Science 300 or an equivalent course is required for further courses in Geophysics.

Fourth Year: Physics 482,495; Geophysics 525, 527, 528; one of the following if not previously taken: Geology 420, 423, 445, 460, 524, Meteorology 406

412, 511, 516, Geophysics 521; one of the following if not previously taken: Geology 421, 446, 452, Meteorology 407, 517, Geophysics 521; single-term Arts option; approved single-term option.

183.17.5 CONCENTRATION IN PHYSICS

The Department of Physics offers several alternative junior courses.

NOTE: Students who *lack* credit for Grade XII Physics must register in Physics 203, students with credit for Grade XII Physics must select one of Physics 205, 212 or 242 as a first course.

Physics 203 is an introductory non-calculus course intended for students who lack credit in Grade XII Physics.

Physics 205 has the same content as Physics 203 but is intended for students who have credit in Grade XII Physics.

Physics 207 is a continuation of Physics 203 or 205 and is intended either as a terminal course or as part of a sequence with Physics 209, 301, 303, 361, 363, 401, 403.

Physics 209 is a continuation of Physics 203 or 205 and is intended either as a terminal course or a part of a sequence with Physics 207, 301, 303, 361, 363, 401, 403.

Physics 212 is a survey course of classical physics utilizing calculus. Prerequisite is Physics 30; corequisites Mathematics 202(1) or 203(1) and 204. It is intended to serve either as a terminal course or as a part of a sequence with Physics 301, 303, 361, 363, 401, 403.

Physics 242 is intended as the first course of a sequence. It is incomplete unless followed by Physics 340 or its equivalent. The sequence Physics 242 and 340 can be followed by more specialized courses in the third year. A calculus course is a necessary corequisite for Physics 242.

Apart from the combination Physics 203 and 242, credit cannot be obtained for more than one of Physics 203, 205, 212 or 242.

Students intending to take more than one Physics course in the general program are advised to satisfy the calculus requirement as early as possible in their program. Students are encouraged to consult the Department of Physics for assistance in planning a program of study.

183.18 Physiology

183.18.1 HONORS IN PHYSIOLOGY

The program leading to the degree of B.Sc. with Honors in Physiology is offered by the Department of Physiology in the Faculty of Medicine.

The honors program is designed primarily to prepare students for advanced study leading to academic and research careers. A choice of courses is available for students with interest in particular branches of Biology. The current trend is towards quantitative aspects of Physiology and students are advised to acquire the best background in Mathematics, and in the chemical and physical sciences, consistent with their interests and abilities.

Students are normally not admitted to the program until they have completed two years of a General Science program. Admission requires the attainment of a grade of 8.0 in Physiology 410 (or an equivalent course) and an overall grade point average of 7.0. Continuation within the program requires a minimum grade point average of 7.0. Students considering Honors in Physiology must consult the Program Advisor in the Department.

A sample program is indicated below.

First Year: Two of Biology 296, 297, 298, 299; Chemistry 202; Mathematics 202 or 203 and 204, or 207 and 208; Physics 205 and Physics 207 or 209, 202 or 240; a junior course in English.

Second Year: Physiology 410; Zoology 325/326; Chemistry 350; German 210 or Russian 210 or an Arts option; one of the following: Chemistry 370, Mathematics 302/303 or 307/308, Physics 340.

Third Year: Biochemistry 300; Biology 445; Physiology 403; other courses by arrangement with the Department.

Fourth Year: Other courses by arrangement with the Department.

183.19 Psychology

183.19.1 HONORS IN PSYCHOLOGY

The Department offers courses leading to the degrees of B.A. and B.Sc. with Honors in Psychology. Students wishing to emphasize the humanities and social sciences in their program should register for the B.A.; those who wish to emphasize the physical and biological sciences should register for the B.Sc. With either degree, the program is especially, but not exclusively, appropriate for students considering post graduate study, training, or research in Psychology. The Department requires that students have a 7.0 GPA from the immediately preceding year in order to enter the program, and maintain a 7.0 GPA each year in order to continue in the program. Students are not normally admitted to the first year of Honors in Psychology; they may not enter the program after the beginning of their third year.

Honors in Psychology requires a minimum of eight and a maximum of ten full-session courses (or equivalent) in Psychology including the following: Psychology 309 (prerequisite Mathematics 30 or 100) or, with consent of the Department, Statistics 255 or Computing Science 322; one Science course with laboratory; one Arts course; and the Honors Seminars 306 and 307 (or 301) and 406 and 407 (or 401). The Honors Seminars will ordinarily be taken in the second and third years of the student's residence in the Honors program at the University. An important feature of the Honors program is the opportunity for the student to engage in independent study and research. During the third year, students will complete a research apprenticeship and, during the fourth year, students will write an empirical Honors thesis (Pyschology 599), both with the guidance of a faculty member in the Department of Psychology. A minimum of five courses will be taken in related subjects. The courses in related subjects might be all in one field (e.g., Mathematics or Biology) or in several fields, depending on the student's special interest and relevance of the courses to the subject matter of Psychology.

In addition a minimum of five optional courses will be chosen; some of these will be integrated with the program in Psychology while others can be general options.

For the B.Sc. with Honors in Psychology, the student's program must include a minimum of twelve full-session courses (or the equivalent) from the Faculty of Science.

Honors students must have their program approved by a Department Advisor.

183.19.2 SPECIALIZATION IN PSYCHOLOGY

This program must include English 200 or 210. The equivalent of twenty full-session courses must be completed, of which a minimum (or the equivalent) of five and a maximum (or the equivalent) of eight full-session courses must be Psychology courses. The courses from Psychology must include:

(a) Psychology 260 and Psychology 261.
(b) Psychology 309 (Statistics) or with the consent of the Department, Statistics 255 or a Computing Science course may be substituted.
(c) One single-term course from the following:
  (1) Psychology 360 (Experimental)
  (2) Psychology 362 (Learning)
  (3) Psychology 366 (Perception)
(d) One single-term course from the following:
  (1) Psychology 341 (Social Psychology)
  (2) Psychology 383 (Personality)
(e) A minimum of two and one-half and a maximum of five and one-half options from the Psychology offerings (Arts and Science).

The student's program must include a minimum of twelve full-session courses (or the equivalent) from the Faculty of Science. It is strongly recommended that supporting courses be selected from the following three general areas: Mathematics (Departments of Mathematics, Statistics, or Computing Science), Biology (or Physiology) and Philosophy.

Specialization students must have their program approved by a Department Advisor.

183.19.3 CONCENTRATION IN PSYCHOLOGY

The Department of Psychology offers courses leading to both B.A. and B.Sc. degrees. Students wishing to emphasize the humanities and social sciences in their programs should register for the B.A. and follow one of the sequences suggested in the Faculty of Arts section of this Calendar. Students wishing to emphasize the biological sciences should register for the B.Sc.

Students selecting Psychology as a principal subject of concentration should take: (a) Psychology 260, 261 and 309, (b) two of Psychology 362, 366 and 368, (c) one of Psychology 341, 353 and 383, (d) two full courses in Psychology listed in the Science section of the calendar and (e) a maximum of one full course in Psychology listed in either the Science or Arts sections of the calendar. Students selecting Psychology as a second subject of concentration should complete the requirements by taking courses listed under a, b and d above (three-course sequence) or those listed under a, b, d and e above (four-course sequence).

NOTE: Since Psychology 309 is prerequisite or corequisite for Psychology 362 and 366 it should be taken in the second year.

183.20 Statistics and Applied Probability

183.20.1. HONORS IN STATISTICS

This program is designed to prepare students with a high level of intellectual ability for careers as statisticians. Emphasis is placed on the understanding of random phenomena, statistical inference procedures and some area of potential application chosen by the student.

At least three approved courses in one distinct field must be taken at the 400 level or above. Examples of fields of applications are Biology, Business, Computing Science, Economics, Engineering, Pharmacology, Political Science, Psychology, and Sociology. The student should plan carefully so that the proper prerequisites are taken early in the program. Consult the Department of Statistics and Applied Probability as soon as possible on specific program recommendations in the field of application chosen.

The program consists of twenty full-session courses.

First Year: Mathematics 207/208, Mathematics 281/282 or Mathematics 281/381, Physics 242, one Arts option, one option.

Second Year: Mathematics 307/308, Mathematics 282 or Mathematics 381, one term Mathematics option, Statistics 365/366, two options.

Third and Fourth Years: Mathematics 495, Mathematics 442/443, Mathematics 405/406, seven options.

In addition, the degree must include at least two courses selected from Statistics 465, 466, 471, 472.

Each program must be approved by the Department. Each program is subject to the requirements of the Faculty: at least 12 full-session courses in the Faculty of Science, at least 3 full-session courses in the Faculty of Arts, and no more than 7 junior (200 level) courses. For Faculty requirements see § 183.1.1.

183.20.2 SPECIALIZATION IN STATISTICS

This program is intended for students who are interested in applying statistics to a second discipline. It can lead to a variety of careers. Examples of fields of applications are Agriculture, Business, Chemical Engineering, Computing Science, Economics, Education, Genetics, Health Services Administration, Pharmacology, Political Science, Psychology, Sociology, and Zoology.

The program consists of twenty full-session courses satisfying the requirements of the Faculty of Science. In addition, it must include the equivalent of three approved full-session courses in Mathematics, three approved full-session courses in Statistics, one approved full-session course in Computing Science, and three full-session courses in a single field of application.

An example of an acceptable four-year sequence is given below:

First Year: Mathematics 202/204, Mathematics 221/222, Computing Science 214/215, one Arts option, one option.

Second Year: Mathematics 302/303, Statistics 365/366, three options.

Third Year: Statistics 465/468, Statistics 471/472, three options.

Fourth Year: Five options.

Each program must be approved by the Department of Statistics and Applied Probability. The student is advised to consult the Department regarding specific program recommendations for the field of application chosen. For Faculty requirements see § 183.1.2.

183.20.3 CONCENTRATION IN STATISTICS

Students in the three year degree program who are interested in Statistics should follow the first three years recommended for Specialization in Statistics. This gives the student flexibility in switching from one program to another. It also increases the number of career possibilities after graduation. Students should consult the Department of Statistics and Applied Probability as soon as possible regarding the choice of their courses.

183.21.1 HONORS IN ZOOLOGY

The Honors Program in Zoology is intended primarily for students planning to continue into post-graduate study and a research or academic career. It also provides a comprehensive background in Zoology for those planning a teaching career in science with emphasis on biology, or for students interested generally in science.

The study of animals is wide-ranging and complex. At the molecular level, biological processes depend on the same phenomena that underlie chemistry, physics and the other natural sciences. Quantitative techniques in biology are rapidly being improved in the understanding of subcellular processes, the aggregation and differentiation of cells, the mechanics of complex organisms, the analysis of populations and ecosystems, and the ramifications of taxonomic relationships. Consequently, it is necessary that zoologists have a background in chemistry, physics and mathematics.

Normally, the Honors Program will be completed in four years. Special arrangements for extension of time must be made through the student's advisor and the Honors Students Committee of the Department of Zoology.

An overall Grade Point Average of 6.5 must be maintained each year in the Zoology Honors Program.

The Zoology Honors Program is comprised of the equivalent of 40 single-term courses. Ten of these shall be courses in Science, including one full year in each of Chemistry, Physics and Mathematics and/or Statistics; of the four remaining courses in Science, at least one shall be in a department other than Chemistry, Physics, Mathematics, Statistics and Applied Probability, or Zoology. Statistics 337 is recommended as one of the ten courses. Six shall be courses in the Introductory Biology Program (Biology 296, 297, 298, 299, 301, 302). Twelve shall be courses in Zoology, which should include Zoology 304, 305, 340 (or 441, or 442), 352, 353, 463, and 421. Six shall be courses in Arts, including the equivalent of two in English, French, or a foreign language. The remaining six shall be approved options for the student.

Honors route in Cell Biology and Physiology. The above section describes the main route to an Honors degree in Zoology. A second Honors route in Zoology is available with an emphasis on Cell Biology and Physiology. It requires the same six courses in Introductory Biology and six courses in Arts but it specifies ten Science courses to be taken: Chemistry 200 or 302, Chemistry 250 or 350, Mathematics 202 and 204, Physics 203/207 or 203/209 or Physics 205/207 or 205/209, Biochemistry 300. It requires ten single-term courses in Zoology or Biology as follows:

(a) Four shall be Zoology 352/353 and Zoology 325/340
or
Zoology 304/305 and Zoology 350/340;
(b) Three shall be chosen from Zoology 441/442, Zoology 411/412, Biology 445;
(c) Three additional courses from Zoology or Biology of which Zoology 421 and Zoology 462 or 463 are highly recommended.

The remaining eight courses may be taken in any department but must be approved as appropriate in the program.

Each student in the Zoology Honors Program has an assigned advisor, who is to be consulted whenever program decisions are taken. The program is flexible enough to fit individual requirements. A student may arrange with his/her advisor and the Honors Students Committee to substitute some courses in closely related fields (e.g., Biology, Marine Science, Paleontology, Physiology) for Zoology courses.

Students are required to take a comprehensive oral examination on animal biology and biological principles during their fourth year.

An effort is made to employ Honors students in biological research during the summer.

183.21.2 HONORS IN ZOOLOGY AND GEOLOGY

See "Honors in Geology and Zoology", § 183.10.2, above.

183.21.3 SPECIALIZATION IN ZOOLOGY

The Specialization Program in Zoology is intended for students who wish to pursue Zoology further than is possible in the General Degree Program. Students in this program are urged to develop a strong background in Chemistry, Physics and Mathematics. It is possible to proceed to post-graduate study from the Specialization Program, but the Honors Program provides a stronger foundation for that.

Normally, the Specialization Program will be completed in four years. Special arrangements for extension of time must be made through the student's advisor and the Specialization Students Committee of the Department of Zoology.

An overall Grade Point Average of 5.5 must be maintained each year in the Zoology Specialization Program.

The Specialization Program comprises the equivalent of 40 single-term courses. Of these, ten shall be courses in Zoology or Biology, including Zoology 325 (or Zoology 304 and 305) and 350 (or Zoology 352 and 353). Four shall be courses in the Introductory Biology Program (Biology 296, 297, 298, 299, 301, 302). Eight shall be single-term courses in Science, other than Zoology or Biology. These eight must include courses in at least four departments, including Chemistry. Statistics 337 is recommended as one of the eight courses. Six shall be courses in Arts, including the equivalent of two in English, French or a foreign language. The remaining twelve shall be approved options. Approved options may include Zoology, Science or Arts courses, or courses in other faculties with permission.

Each student in the Zoology Specialization Program has an assigned advisor, who is to be consulted whenever program decisions are taken. A student may arrange with his/her advisor and the Specialization Students Committee to substitute some courses in closely related fields (e.g., Biology, Marine Science, Paleontology, Physiology) for Zoology courses.

183.21.4 CONCENTRATION IN ZOOLOGY

Students intending Zoology as a subject of concentration in a three-year degree program should take Biology 30 and Chemistry 30 for matriculation.

Students lacking Biology 30 must register in Biology 130 in University. Students who have completed Biology 30 will take two of Biology 296, 297, 298, 299 in University. In first year, Chemistry 250 and Physics 203 and 207 or 209, or 205 and 207 or 209 should be taken.

A general program student usually can proceed to graduate work in Zoology only by spending a year as a special student after taking the B.Sc. If an undergraduate in the general program wants to do graduate work

in Zoology, the Chairman of the Department should be consulted for advice on the best combination of courses in the final years of the undergraduate program.

183.22 *Interdisciplinary B.Sc. Program in Food Science*

A four-year interdisciplinary program in Food Science is offered co-operatively by the Faculty of Agriculture and Forestry, the Faculty of Home Economics, and the Faculty of Science. It allows students to specialize in this expanding field more than is possible in the third- and fourth-year specialized program in Food Science offered by the Faculty of Agriculture and Forestry.

The program is administered by an interdisciplinary committee consisting of the Deans of the Faculties of Science, and Agriculture and Forestry (or their representatives), the Dean and a faculty member of the Faculty of Home Economics, the Chairman and a faculty member of the Department of Food Science, and two undergraduate students. The Chairman of the Department of Food Science acts as the coordinator of the program. Students in the program are, for administrative purposes, registered in the Faculty of Agriculture and Forestry.

The outline of the program is as follows:

First Year: Chemistry 202; Chemistry 250; Mathematics 240 (or 242); Food Science 200; one single-term course in English or Agriculture and Forestry 204; one and one-half full-session approved options.

NOTE: Students lacking Biology 30 must take Biology 130.

Second Year: Biochemistry 300, Microbiology 315 and 365; Physics 203 (or 205) and 207; Statistics 241; Food Science 351 and 383; one-half full-session approved option.

Third Year: Chemistry 312; Food Science 402, 453 and 454, 461, 471, and one and one-half full-session approved options.

Fourth Year: Foods and Nutrition 464 and 465; and four full-session approved options.

Note: At least one and one-half of the approved options must be taken in Food Science.

The following points should be noted:

(1) *Admission.* The program is designed so that students may register in it immediately on entering University or may transfer from the Faculties of Agriculture and Forestry or Home Economics or Science after their first or possibly after their second year. The matriculation requirements for those entering the program from high school are set out in § 13.3.2 of the University Regulations and Information for Students Calendar. Applicants are required to demonstrate proficiency in the English language as outlined in § 14.3 of the University Regulations and Information for Students Calendar.

(2) *Promotion.* Promotion from year to year will be decided by the Interdisciplinary Committee, but in general the requirements for promotion will be similar to those of the Faculty of Agriculture and Forestry.

(3) *Graduation.* The Interdisciplinary Committee will recommend approval of the candidate for the degree by the Council of the Faculty of Agriculture and Forestry.

(4) *Scholarships.* Details of scholarships for which students in the program are eligible are listed under the Faculty of Agriculture and Forestry in the Awards Calendar.

All inquiries should be directed to the Dean of the Faculty of Agriculture and Forestry or the Chairman of the Department of Food Science.

183.23 *Marine Science*

A marine station is established at Bamfield on Vancouver Island where there are excellent opportunities for the study of marine biology and related subjects. An academic program is in operation at the station, in which summer study will provide credit towards degrees in Science.

Information concerning course prerequisites and application procedures for Marine Science may be obtained from the Departments of Botany and Zoology, or the Office of the Dean of Science. Permission to register in these courses may be obtained from the Director of the Bamfield Marine Station, to whom application should be made.

NOTE: For details of courses see § 184.18.

183.24 *Northern Studies*

Students interested in Canada's North and especially students planning a career in northern Canada are encouraged to include within their curriculum some of the following courses: Anthropology 202, 305, 350 and 414; Biology 130 or two of Biology 296, 297, 298, 299; Botany 301, 302, 321 and 422; Geography 230/231, 333/334, 424, 445/446, 465, and 468/469; Geology 201, 302, 380, 582 and 592; Interdisciplinary Studies 416; Meteorology 307; and Political Science 200 and 322. These courses may be taken within the framework of existing General, Specialization or Honors programs in the Faculty of Science. Students interested in Northern Studies should mention this fact to their faculty advisor.

183.25 *Paleontology*

The program in Paleontology is designed for Honors students in Geology, Zoology, and Anthropology having interests in vertebrate and invertebrate paleobiology, including evolution and systematics, historical biogeography, functional morphology and stratigraphic distribution. The program may be entered through the framework of existing programs in the Departments of Geology, Zoology, and Anthropology. Interested students should consult with their Honors advisor in preparing their programs.

NOTE: § 183.26 Reserved.

183.27 *Pre-Professional Programs for Medicine and Dentistry*

183.27.1 REQUIREMENTS

Admission to the Faculties of Medicine and Dentistry is contingent upon the successful completion of two years of university study. The requirements to enter the Faculty of Dentistry are detailed in § 183.27.2 below. The requirements to enter the Faculty of Medicine are given in § 183.27.3 below. A student planning to enter one of these Faculties may register in a General B.Sc.

program in the Faculty of Science. Students who wish to enter the Faculty of Dentistry or Medicine upon completion of the second year in Science should apply to the office of the Dean of Dentistry or Medicine at the *beginning of the said second year.*

183.27.2 PRE-DENTAL REQUIREMENTS

Students who wish to enter the Faculty of Dentistry should ensure that their pre-professional program is approved by the Dean of Science. The Faculty of Dentistry awards the degree of B.Sc. to students who complete two pre-professional years and the first two years of the D.D.S. program successfully.

First Year: Chemistry 200 (or 202) or Chemistry 250, Biology 130 or two of Biology 296, 297, 298, 299; Physics 203 and Physics 207 or 209 or Physics 205 and Physics 207 or 209 or Physics 242; a full-session or two half courses in Arts; a full-session course or the equivalent in Arts or Science or a half course in Arts and a half course in Science.

NOTE: If the student takes Chemistry 202, Mathematics 202 or 203 must be taken concurrently. If the student takes Physics 242, Mathematics 202 (or 203) and 204 must be taken concurrently.

Second Year: Chemistry 350 (if Chemistry 200 or 202 was taken during the first year) or Chemistry 302 (if Chemistry 250 was taken during the first year); a full-session senior Arts course or two half senior Arts courses; two full-session or equivalent senior Science courses (Physics 340 must be one of these two courses if Physics 242 was taken in the first year); a full-session course or the equivalent in Arts or Science or a half course in Arts and a half course in Science.

NOTE: Courses in the Departments of Biochemistry and Physiology may not be included as Science options in either pre-professional year.

183.27.3 PRE-MEDICAL REQUIREMENTS

Students who wish to enter the Faculty of Medicine should ensure that their pre-professional program is approved by the Dean of Science or one of his or her associates. For students at The University of Alberta the program is as follows:

First Year: Chemistry 250, or Chemistry 200 or 202; English 210 or any two half courses in English at the junior level; Biology 296; one of Biology 297, 298 or 299; Mathematics 202 (or 203) and Statistics 241 or Psychology 260 and 261; Physics 205 and 207 or 209 or Physics 212 or Physics 203 and 207 or 209 if the student does not have credit in Physics 30.

Second Year: Chemistry 302 (if Chemistry 250 was taken during the first year) or Chemistry 350 (if Chemistry 200 or 202 was taken during the first year); Zoology 325; Microbiology 315; Genetics 351 or Biology 297 and Genetics 375 (if Biology 297 was taken in first year, then a half-year option in Arts or Science may be taken); Psychology 260 and 261 (if not taken in first year), or Mathematics 202 (or 203) and Statistics 241 (if not taken in first year); senior Arts option (full year course or two half-year courses).

NOTE: (1) Students who want to enter a 4-year program in either Biochemistry, Botany, Chemistry, Computing Science, Genetics, Geography (Survey Science), Geology, Mathematics, Microbiology, Pharmacology, Physics or Physiology, should they not be admitted into Dentistry or Medicine, are strongly advised to take Mathematics 202 (or 203) and 204 or 207 and 208 in the first year and to reduce the Arts option in the second year to one half-year course (for those in the pre-medicine pattern). (2) Courses in the Departments of Biochemistry and Physiology may not be included as Science options in either preprofessional year. (3) Students who are not accepted by the Faculty of Medicine or by the Faculty of Dentistry may continue in the General (three-year) Program of the Faculty of Science or, in appropriate cases, transfer to the third year of one of the four-year programs. (4) The Faculty of Medicine awards the degree of Bachelor of Medical Science to students who complete two pre-professional years and the first two years of the M.D. program successfully. (5) Students wishing to apply to the Faculty of Medicine at the University of Calgary should complete the B.Sc. General Degree and include both Biochemistry 300 and Physiology 410 or Zoology 441/442 in the third year of their program.

183.28 Pre-Veterinary Medicine

See § 33.4.1 and 33.4.2 of the Faculty of Agriculture and Forestry calendar regarding general information and program of courses in the two years of the Pre-Veterinary Medicine program. The requirements of this program can be satisfied by taking the Pre-Medicine Program in the Faculty of Science (§ 183.27.3). Consult one of the Associate Deans or the Assistant to the Dean for details.

183.29 Pre-Speech Pathology and Audiology

Those students wishing to enter the Speech Pathology and Audiology program in Rehabilitation Medicine may register for the pre-professional year in the Faculty of Science. The pre-professional year must include the following courses or their equivalents: REHAB 280 and 281; PSYCO 260 and 261. Applications for transfer to Rehabilitation Medicine should be made during the winter session. Further information may be obtained from the Faculty of Rehabilitation Medicine.

183.30 Pre-Optometry

Arrangements have been made whereby a maximum of seven students from Alberta wishing to enter the School of Optometry at the University of Waterloo may take one or two pre-professional years at The University of Alberta. Applicants must be Canadian Citizens or be residents of Canada who have held permanent resident (landed immigrant) status for at least twelve months prior to the registration day of the Fall Term.

Students taking only a one year pre-optometry program should register in the following courses: Biology 296 and 299; Chemistry 202 or Chemistry 250; Mathematics 202 or 203 and 204; Physics 242; Psychology 260; half-course Arts option.

Students taking a two year pre-optometry program should register in the following courses:

First Year: Biology 296 and 299; Chemistry 202 and 250; Mathematics 202 or 203 and 204; Junior Arts option (full course or two half courses).

Second Year: Physics 242; Biochemistry 300; Zoology 325; Microbiology 315; Psychology 260; Statistics 241; Senior Arts option (full course or two half courses).

PLEASE NOTE: courses in human anatomy, histology and embryology and physical optics, that are comparable to those at the University of Waterloo, are not available in this pre-optometry program.

Applicants should obtain the appropriate O.U.A.C. application form from the Registrar of the University of Waterloo soon after October 1.

For further information consult the Faculty of Science Office and/or the Calendar of the University of Waterloo.

184 DETAILS OF COURSES

184.1 General Information

Courses open to students in the Faculty of Science are listed here in alphabetical order, whether they are offered by the Faculty of Science or by another faculty.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 and up are normally restricted to honors and graduate students.

Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages. A normal full-session course is weighted 6. A single-term course is weighted 3. Some honors and graduate courses involving research may vary in weight according to the length and difficulty of the project. Some courses are offered for credit only, and carry a weight of 0.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. The expression "3/2" means three hours of instruction every second week. If the course is a single-term course, the term in which it is offered is mentioned.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LIST DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

Note: § 184.2 Reserved.

184.3 Astronomy

Department of Physics

ASTRO 253. *Astronomy.* ★6 (3-0-0). This is a general course in astronomy. Major topics presented include the solar system, properties of stars, galaxies and cosmology. The results from manned and unmanned space probes are included in the discussions. Emphasis is placed on the physical processes responsible for astronomical phenomena. Prerequisite: Mathematics 30 and Physics 30 or 203. Students are advised to have knowledge of trigonometry.

Note:

(i) This astronomy course, unlike ASTRO 353, is available to students in the Faculty of Science,

(ii) non-Science students may obtain credit in only one of ASTRO 253 or 353.

ASTRO 353. *Survey of Astronomical Theories and Techniques.* ★6 (3-0-0). This course is intended primarily for students in the Faculties of Education and Arts. Our current knowledge of the universe is discussed using a descriptive approach avoiding mathematical details wherever possible. Emphasis is placed on understanding our modern picture of the universe. Techiques of observation and analysis are studied through a series of practical exercises. This course will include viewing experience, using the observatory on the roof of the Physics Building, whenever appropriate. Prerequisites: It is recommended that students have credit in Mathematics 30 and Physics 30 or 203. Note: (i) Credit may be obtained in only one of ASTRO 253 or 353. This course is not available for credit to students registered in the Faculty of Science.

ASTRO 410. *Astrophysics.* ★6 (3-0-0). Summary of the concepts in physics and astronomy which are relevant to astrophysics; stellar spectra, atmospheres, interiors and evolution; galactic structure; cosmology. Prerequisites: MATH 202 or 203 and 204; PHYS 240. Some additional knowledge of mathematics (e.g., MATH 302/303) and astronomy (e.g., ASTRO 253) would be advantageous.

NOTE A: Credit may not be obtained for both Astronomy 253 and Astronomy 353.

NOTE B: All three courses described include viewing experience using the observatory on the roof of the Physics Building whenever appropriate.

NOTE C: The following specialized courses in Astrophysics are offered by the Department of Physics: Physics 563, 565 (see § 184.27 for details).

184.4 Biochemistry

Department of Biochemistry,
Faculty of Medicine

BIOCH 300. *General Biochemistry.* ★6 (3-0-3). Structure and chemistry of the cell; the chemistry and metabolism of carbohydrates, lipids, proteins and nucleic acids; the molecular biology of enzymes and genes as related to the functioning of the living cell. Prerequisites: CHEM 200 or 202; and CHEM 250 or 350.

BIOCH 501. *Advanced Laboratory.* ★6 (0-0-8). A laboratory course to accompany the graduate lecture courses offered to fourth year Honors and to graduate students. Emphasis on standard methods and techniques as applied to biochemical research. Note: Available to fourth-year Honors Biochemistry students only.

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). A detailed description of enzymatic reactions in biosynthetic pathways of carbohydrate, amino acid, vitamin and coenzyme metabolism, emphasizing interrelationships among metabolic pathways, and stressing relationships between metabolic pathways and growth and function of microbial and animal cells. Prerequisite: BIOCH 300 or equivalent. Offered in alternate years. [Microbiology]

BIOCH 511. *Enzymology.* ★3 (First Term, 3-0-0). The properties and structures of enzymes; the chemistry, mechanisms and kinetics of selected enzymic reactions. Prerequisites: BIOCH 300 or equivalent. CHEM 370 or 372. Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 512. *Metabolic and Cellular Control Mechanisms.* ★3 (Second Term, 3-0-0). Regulation of multienzyme systems, feedback controls and allosteric enzymes. Computer simulations. Hormonal controls. Regulation of DNA and RNA biosynthesis. Genetic control of protein biosynthesis and metabolic pathways. Prerequisites: BIOCH 300 or equivalent. CHEM 370 or 372. BIOCH 511 is a recommended prerequisite.

Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 521. *Nucleic Acids.* ★3 (First Term, 3-0-0). The nucleic acids from the points of view of chemistry, structure, biosynthesis and function. Prerequisites: BIOCH 300 or equivalent. Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 531. *Chemistry of Proteins.* ★3 (Second Term, 3-0-0). A lectures course on topics in protein chemistry, including: electrochemical properties; size, shape and hydration; methods for establishment of primary, secondary and tertiary structure; relation of structure to function as exemplified by special protein systems. Prerequisites: BIOCH 300 or equivalent, CHEM 370 or 372. Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 581. *Structure and Function of Biological Membranes I.* ★3. (First Term, 3-0-0). A general survey of structure and function of biological membranes. The structure and properties of various phospholipid-water model membrane systems and the molecular interactions of these systems with ions, sterols, antibiotics and proteins will be considered initially. The composition, molecular architecture and many of the functions of biological membranes will then be discussed, with emphasis on the important role of phospholipids in determining many of the structural and functional properties of these complex structures. Use of the current literature will be stressed. Prerequisites: BIOCH 300 and CHEM 370 or 372 or consent of the Department. Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 582. *Structure and Function of Biological Membranes II.* ★3. (Second Term, 3-0-0). Selected topics in membrane biochemistry. These will include bioenergetics and membrane transport and the role of membranes in the regulation of specific intracellular and intercellular phenomena. Prerequisite: BIOCH 581 or consent of the Department. Note: Designed for advanced Honors and Graduate students and offered in alternate years.

BIOCH 608. *Macromolecular Structure Analysis I.* ★3 (First Term, 3-0-3). The application of electron microscopy to the examination of the structures of macromolecular assemblies such as viruses and membranes. Emphasis on preparation techniques, using the transmission EM, and interpreting micrographs. Designed for senior honors and graduate students. Prerequisite: Consent of the instructor. Maximum enrollment of 10 students. Offered in alternate years.

BIOCH 609. *Macromolecular Structure Analysis II.* ★3 (Second Term, 3-0-3). The principles of X-ray crystallography as applied to the study of protein and nucleic acid structure. Students will collectively carry out a structural determination of a suitable small molecule of biological interest. Designed for senior honors and graduate students. Prerequisite: Consent of the instructor. Maximum enrollment of 10 students. Offered in alternate years.

BIOCH 623. *Special Topics in Research on Polynucleotides.* ★2 (0-2s-0). Prerequisite: BIOCH 521 or consent of the Department.

BIOCH 626. *Special Topics in Protein Research.* ★2 (0-2s-0). A seminar course for advanced students. Detailed consideration is given to recent advances in research on protein structure and function and mechanism of enzyme action. Prerequisites: BIOCH 511 and 531 or consent of the Department.

BIOCH 630. *Elements of Modern Biophysics.* ★3 (both terms, 1.5-0-0). Course content will vary from year to year but will include topics such as quantum mechanics for biochemists, nuclear magnet relaxation theory, and fluorescence spectroscopy. Intended for graduate students in the biological sciences interested in physical techniques and their application to studies of biological systems. Format will include seminars by the students themselves. Prerequisite: Consent of the instructor.

BIOCH 671. *Recent Advances.* ★2 (0-2s-0). A seminar course on topics of current interest in Biochemistry. Note: Open to Graduate students in Biochemistry only.

NOTE: Clinical Biochemistry courses formerly known as Biochemistry 400 and Biochemistry 401, are now designated Clinical Biochemistry 369 and Clinical Biochemistry 408 respectively and are administered by the Department of Pathology. See § 124.16 of the Faculty of Medicine Calendar.

184.5 Biology

Departments of Botany, Genetics, Microbiology and Zoology (Faculty of Science) in co-operation with the Departments of Entomology (Faculty of Agriculture and Forestry) and Bacteriology (Faculty of Medicine)

BIOL 130. *Introductory Biology.* ★6 (3-0-3). A basic biology course emphasizing the diversity and interrelations of organisms, the relationships between form and function, heredity, cellular structure, and ecological principles. Note: Not open to students with credit in Biology 30.

BIOL 210. *Biology and the Modern World.* ★3 (either term, 3-0-3). Biological basis for an ecology of man including human origins, evolution, biological peculiarities and exploding populations; man's place in and influence on the biosphere; speculation concerning man's future. Demonstration laboratories and discussions. No prerequisite. This course may be combined with ENT 209 to make a full course in biological science.

BIOL 296. *Evolutionary Biology.* ★3 (either term, 3-0-3). The numbers and kind of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: Biology 30.

BIOL 297. *Heredity.* ★3 (either term, 3-0-3). The cellular and molecular basis of the transmission of hereditary characteristics: Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance; linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: Biology 30. Note: Students cannot receive credit for both BIOL 297 and GENET 351. Those taking BIOL 297 should take GENET 375 for the equivalent of GENET 351.

BIOL 298. *Environmental Biology.* ★3 (either term, 3-0-3). The basic principles and concepts of ecology. Emphasis on antecology, natural selection, structure and function of populations, communities, and ecosystems. Laboratory to include ecological experiments, demonstrations, and discussions. Prerequisite: Biology 30.

BIOL 299. *Biological Function.* ★3 (either term, 3-0-3). Comparative physiology of animals and higher plants from the standpoint of nutrition, energetics, gas exchange, circulation, ionic and osmotic relations and control systems. Prerequisite: Biology 30.

BIOL 301. *Cellular Biology.* ★3 (First Term, 3-0-3). The ultrastructure and metabolism of cells. Energy in biological systems; photosynthesis; cellular respiration; contractility; cell growth and replication. Prerequisite: BIOL 297. Pre- or corequisite: CHEM 250 or 350. It is also recommended that BIOL 299 precede BIOL 301.

BIOL 302. *Developmental Biology.* ★3 (Second Term, 3-0-3). Development of complex organisms. The purpose is to identify some developmental processes common to plants and animals. Emphasis is on cellular interactions which determine cell survival, gene activation and deactivation, and how cell functions and structures are selected. The course concludes with consideration of how these processes relate to aging and cancer. BIOL 301 is strongly recommended to precede BIOL 302.

BIOL 415. *History and Theory of Biology.* ★3 (either term, 3-0-0). An outline of biological discovery from early times to the present, and of the principal ideas stemming from or influencing the life sciences; both in relation to social, historical and cultural developments. Especially recommended to honors students in the biological subjects, but open to general students interested in the history of science as a force in the development of culture. Prerequisites: Two of BIOL 296, 297, 298, 299 or consent of the Department.

BIOL 420. *Introduction to Theoretical Biology.* ★3 (First Term, 3-0-0). An introduction to theoretical problems and methods in modern biology. Emphasis is laid on attempts toward theoretical unification of biological and physical concepts. Intended for Honors students in the biological subjects, but open to general students interested in scientific explanation. Background in mathematics, physics and biology is recommended. Prerequisites: PHYS 313, MATH 204 and another single-term course in calculus.

BIOL 445. *Cell Physiology.* ★3 (Second Term, 3-0-3). Current advances in cell biology. The integration of biochemical and structural changes with cell function. Prerequisites or corequisites: BIOCH 300 or PL SC (Plant Biochemistry) 431 and 432 or consent of the Department. Offered in alternate years.

BIOL 507. *Taxometrics.* ★3 (First Term, 3-0-0). Theoretical and practical aspects of quantitative classification. Relation of taxonomic systems to information retrieval. Prerequisite: Consent of the Department.

BIOL 584. *Biological Ultrastructure.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

BIOL 585. *Electron Microscopy.* ★3 (Second Term, 0-0-6). Prerequisites: BIOL 584 strongly recommended; PHYS 519 recommended. Note: Enrolment strictly controlled due to limited facilities; consent of the instructor required.

BIOL 620. *Seminar in Selected Topics of Modern Biology.* Weight according to work done to a maximum of ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

184.6 Botany

INT D 230. *Practical Plant Biology.* ★3 (First Term, 3-0-3). The practical aspects of plant structure and classification. Laboratory exercises will emphasize crop plants. Prerequisite: Biology 30 or 130 or consent of Departments. (Offered jointly by the Department of Botany and the Department of Plant Science.) The Department of Plant Science is responsible for registration.

BOT 301. *Flora of Alberta I.* ★3 (First Term, 2-0-4). A survey of the nonvascular plants of Alberta with emphasis on identification. Prerequisite: BIOL 296 or consent of the Department.

BOT 302. *Flora of Alberta II.* ★3 (Second Term, 2-0-4). A survey of the families of vascular plants in Alberta; their characteristics, classification, evolutionary relationships and identification. Prerequisite: BIOL 296 or consent of the Department.

BOT 304. *Field Botany.* ★3 (Summer Session only, 2-0-4). Designed to acquaint students with the collecting, identifying and curating of the major groups of plants in their natural habitats. Topics will include selected ecological and phytosociological concepts, field methods, keys and identifications and herbarium methods. Effective handling of both specimens and field data for scientific purposes will be stressed. Plant collections prepared to acceptable herbarium standards will be required of those taking this course. Prerequisite: Biology 30 or 130 or permission of the instructor. There will be a transportation charge of $5.00 or less per person.

BOT 309. *Structural Botany.* ★3 (First Term, 3-0-3). A developmental approach to the structure of vascular plants emphasizing seed plants. Cytology, apical meristems and differentiation, histogenesis, organogenesis, secondary growth, comparative wood and floral anatomy, secretory structures normally included. Prerequisite: BIOL 296 or equivalent or the consent of the Department.

BOT 314. *Flowering Plants.* ★3 (First Term, 3-0-3). The origin and evolution of flowering plants; their morphology and classification; species concepts; adaptation; principles of nomenclature. Prerequisite: BIOL 296 or consent of the Department. Offered two years out of three (next in 1982-83, 1983-84).

BOT 322. *Plant Ecology.* ★3 (First Term, 3-0-3). Ecological principles and relationships in the terrestrial plant world. Major topics include plant community, vegetation, physical environment, autecology, genecology, ecosystem function, plant population, succession, classification and ordination of communities. Field work consists of two one-day trips to study boreal forest and aspen parkland, and three half-day trips for orientation, plant community analysis, and environmental measurement. Prerequisite: BIOL 298 or consent of the Department.

BOT 324. *Plant Physiology I.* ★3 (First Term, 3-0-3). A general course on water and energy relations, evapotranspiration, net assimilation, stresses, ascent of sap, permeability, translocation, mineral nutrition, integration and control of metabolism. Prerequisites: BIOL 299, CHEM 200 or 202, or the consent of the Department. CHEM 250 or 350 is recommended.

BOT 325. *Plant Physiology II.* ★3 (Second Term, 3-0-3). A continuation of Botany 324, including enzymes, respiration, photosynthesis, intermediary metabolism. The regulation of plant growth and development by hormones and pigments from germination through flowering to senescence. Prerequisite: BOT 324 or consent of the Department. CHEM 250 or 350 recommended.

BOT 331. *The Biology of the Algae.* ★3 (Second Term, 3-0-3). The taxonomy, morphology, fine structure, evolution and general biology of algae, both freshwater and marine. Prerequisite: BIOL 296 or the consent of the Department.

BOT 332. *Bryology and Lichenology.* ★3 (Second Term, 2-0-4). The phylogeny, ecology, identification, and taxonomy of mosses and hepatics and the structure, chemistry, and identification of lichens. Prerequisite: BIOL 296 or consent of the Department.

BOT 341. *Biology of the Fungi.* ★3 (First Term, 3-0-3). The structure and development of fungi with emphasis on adaptation to the environment. Laboratory will provide opportunities to study the diversity of structure in fungi and to use the classification system. Prerequisite: BIOL 296 or consent of the Department.

BOT 342. *Fungal Physiology.* ★3 (Second Term, 3-0-3). The physiology of growth and reproduction in fungi and the effects of factors of the micro-environment on these activities. Laboratory will consist of projects involving culture under controlled environmental conditions. Prerequisite: BOT 341 or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 360. *Morphology and Evolution of Vascular Plants.* ★3 (Second Term, 3-0-3). A morphological and evolutionary survey of vascular plants. Discussion based primarily on living plants but with some inclusion of paleobotanical evidence. Emphasis on vascular cryptogams, gymnosperms, and primitive angiosperms. Prerequisite: BIOL 296 or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 379. *Biology of Economic Plants.* ★3 (First Term, 3-0-0). Lectures will deal with the biology and utilization of economically important vascular and non-vascular plants emphasizing relevant morphology, physiology, distribution and history of use. Prerequisite: BIOL 299 or consent of the Department. Offered in alternate years. Course in Plant Biology is next in 1981-82.

BOT 400. *Special Problems.* ★6 (0-6L-0). Research project approved and supervised by a member of the Department of Botany. Prerequisite: One full-session course in Botany or equivalent.

BOT 401. *Special Problems.* ★3 (either term, 0-6L-0). Research project approved and supervised by a member of the Department of Botany. Prerequisite: One full-session course in Botany or equivalent.

BOT 402. *Special Problems.* ★3 (either term, 0-6L-0). A second research project, approved and supervised by a member of the Department of Botany. Prerequisite: One full senior course in Botany, or equivalent. Note: (a) This course would enable a student to take two one-term projects in the same term or one in each of two different terms. (b) Students to be restricted to one full equivalent of projects in their degree program, i.e., BOT 400 or BOT 401 and 402.

BOT 403. *Summer Field Course.* ★3. A combined seminar and two-week field course on the flora and vegetation of a specified region in North America for honors students in Botany in early May or September. Bi-weekly seminar meetings are held during the preceding second term. Students are charged for meals and lodging (estimated at approximately $100 per person), but transportation is provided. Other students and staff may participate with departmental consent. Offered in alternate years, next in 1981-82.

BOT 408. *Vegetation Science.* ★3 (Second Term, 3-0-3). The description, classification, and ordination of plant communities and vegetation units. Theories, methods and applications. Prerequisites: BOT 322 or equivalent, a course in statistical methods, or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 409. *Plant Microtechnique.* ★3. (First Term, 2-0-4). Theory and practice of preparing plant cells and tissues for observation with light and scanning electron microscopy. Fixation, dehydration, embedding, sectioning, standard staining procedures, some histo-chemistry, use of light microscope, introduction to modern embedment media. Prerequisite: Consent

of the Department. Any course in plant biology recommended. Offered in alternate years beginning in 1981-82.

BOT 410. *Eco Physiology.* ★3 (First Term, 3-0-4). Theory, methods, and description of environmental parameters. The ecological and physiological implications of these parameters are discussed. Laboratory consists of field and indoor instrumentation and independent study using growth chambers and greenhouses. Prerequisite: BOT 322 and 324 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 414. *Chemosystematics.* ★3 (Second Term, 2-0-4). An appraisal of the use of biochemical data in taxonomy and the various techniques available. Prerequisite: BOT 302, 314 or 360 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 421. *Plant Geography.* ★3 (Second Term, 3-0-0). The principles of plant geography. Patterns of plant distribution and their interpretation with respect to the evolution of floras. Prerequisite: Any one of BOT 302, 314, 322, 331, 332, 341, 360 or consent of the Department. Note: Offered one year out of three, next in 1983-84.

BOT 422. *Vegetation of the World.* ★3 (Second Term, 3-0-0). Comparative geographic distribution and structure of plant communities on the continents in relation to geomorphology, climate, and history. Past and present land-use practices and problems in conservation. Offered in alternate years, next in 1982-83. Prerequisite: BOT 322 or consent of the department. BIOL 210 is recommended.

BOT 431. *Ecology of Aquatic Plants.* ★3 (First Term, 3-0-3). The ecology of benthic (e.g., epipsammon, epipelon, epiphyton, epilithon, rhizobenthos) and planktonic plant communities in brackish, freshwater and marine environments. Topics to be covered include adaptations of plants to the various communities and habitats: factors affecting growth and decline of populations; transport of algae; seasonal succession and vertical distribution; rhythms; aspects of palaeolimnology; primary productivity; eutrophication and consequences. There will be at least four one-day field trips which will occur either on a Saturday or Sunday. Prerequisite: BIOL 298 or consent of the Department.

BOT 450. *Physiology of Growth and Development.* ★3 (First Term, 3-0-3). A discussion of the modes of action of pigments and plant growth substances in the development of higher plants, and of the nature of organic solute translocation in its relationship with growth. Laboratory consists of independent study relating to topics covered in the course. Prerequisite: BOT 325 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 451. *Water Relations Physiology.* ★3 (Second Term, 3-0-3). The plant in relation to water, drought resistance, winter hardiness and salinity. Prerequisite: BOT 324 or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 460. *Paleobotany.* ★3 (First Term, 3-0-3). The fossil record of plants as it relates to the evolutionary history of existing groups. Prerequisites: BIOL 296 or consent of the Department. BOT 309 or 360 recommended. Offered in alternate years, next in 1981-82.

BOT 480. *Mathematical Modelling in Ecology and Physiology.* ★3 (First Term, 3-0-0). Combined lectures, workshops and seminars. A rationale of modelling. Classification of dynamic models. Mathematical techniques used in model execution. Students will work on simple models, first as a group, then individually. Choice of modelling topics to suit the student's interest. Prerequisites: MATH 204, and 202 or 203, or equivalent, working knowledge of a computing language and permission of the Department.

BOT 501. *Special Topics in Botany.* ★3 (either term, 0-6L-0). Seminar discussion at an advanced level of topics in a chosen subject area. Prerequisite: Consent of the Department.

BOT 502. *Special Topics in Botany.* ★2 (either term, 0-4L-0). Seminar discussion at an advanced level of topics in a chosen subject area. Prerequisite: Consent of the Department.

BOT 503. *Special Topics in Botany.* ★2 (either term, 0-4L-0). Seminar discussion at an advanced level of topics in a chosen subject area. Prerequisite: Consent of the Department.

BOT 504. *Advanced Mycology.* ★3 (Second Term, 0-6L-0). Reports and discussion of major and current research in the biosystematics and ecology of the fungi. Evaluation of methods of investigation in these areas. Prerequisites: BOT 341 and 342 or consent of the Department.

BOT 509. *Advanced Structural Botany.* ★2 (First Term, 2-0-0). Seminar discussion of current topics in Structural Botany including both research and technical advances. Prerequisite: BOT 309 or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 511. *Advanced Plant Ecology.* ★3 (Second Term, 3-0-0). Seminar discussion of major and contemporary topics in plant ecology, using general readings and students' abstracts of published papers. Prerequisite: BOT 332 or equivalent, or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 512. *Vegetation of North America.* ★3 (Second Term, 3-0-0). Lectures and discussions based on students' abstracts of published papers on plant communities, climate, soils, and autecology of species in the major vegetation types from the arctic to the tropics in North America. Prerequisite: BOT 322 or equivalent, or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 513. *Advanced Chemotaxonomy.* ★3 (First Term, 3-0-0). Seminar Course. Assigned readings of phyto chemical-phylogeny, ecology and related areas. Course to include such topics as: Proteins and Plant Phylogeny, Molecular studies of plant populations, Isozymes in plants — non-protein amino acids — roles and functions. Prerequisite: BOT 414 or consent of the Department.

BOT 514. *Advanced Taxonomy.* ★3 (Second Term, 3-0-0). Seminar course with assigned reading, essays and discussion of modern taxonomy, its principles and problems. Prerequisites: BOT 314 or 332 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 531. *Advanced Phycology and Limnology.* ★3 (Second Term, 3-0-0). Seminar course comprising assigned literature reading, essays and discussion of advances in the fields of phycology and limnology. Emphasis will be placed upon ecological, physiological, morphological, and taxonomic aspects of algae, and modern day limnology including physico-chemical as well as biotic aspects. Prerequisite: Botany 331 or 431 recommended or consent of the Department. Note: Offered in alternate years, next in 1982-83.

BOT 532. *Biosystematics of the Mosses.* ★3 (Second Term, 3-0-0). Lectures, discussions and surveys of the literature of approaches and techniques for studying the phylogeny of mosses. The course will include a historical review of bryology and invited lectures on such topics as phylogenetics, nomenclature, phenetics, biometric analyses of population, experimental taxonomy and herbarium practices. Offered in alternate years, next in 1982-83.

BOT 550. *Physiology of Plant Nutrition.* ★3 (First Term, 3-0-0). The structure and function of plant membranes, mineral uptake and utilization, xylem and phloem transport, photosynthetic productivity, the fixation and metabolism of nitrogen and their role in the total nutritional physiology of the plant. Prerequisite: BOT 324 or 325 or consent of the Department. Offered in alternate years, next in 1982-83.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and investigation in these fields. Offered alternate years. Recommended: BIOCH 300 or PL SC 431 and 432 or consent of the Departments (offered jointly by the Department of Botany and the Department of Plant Science). The Department of Plant Science is responsible for registration. Offered in alternate years, next in 1981-82.

BOT 561. *Advanced Paleobotany.* ★3 (Second Term, 3-0-3). Special problems in paleobotany involving laboratory techniques and readings of current literature and oral and written presentation. Prerequisite: BOT 460 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 580. *Advanced Mathematical Modelling.* ★3 (Second Term, 3-0-0). Seminars by the students covering the use of modelling in their fields of interest. Modelling projects may be involved, according to student interest. Prerequisites: BOT 480 and consent of the Department.

184.7 Cartography

Department of Geography

CART 341. *Principles of Cartography.* ★6 (3-0-3). Compiling, scaling, and symbolizing data for small scale maps. Generalization; statistical treatments; computer processing. Compilation of large scale maps from various sources including aerial photography and non-photographic remote sensing devices; coordinate systems; and projections. Topographic map reading and interpretation. Emphasis on Canadian maps. No prerequisite but GEOG 230 is particularly recommended.

CART 343. *An Introduction to Computer Cartography.* ★3 (Second Term, 3-0-0). Application of computer systems to map-making. Topics include: processing, digitizing and preparation of data; the SHL Thematic Mapping Facility and System; other available computer cartographic programs — SYMAP, PILLAR, GIMMS: interactive development of maps; editing; alternative methods of map representation; applications of computer cartography in e.g. urban planning, information systems, public service provision.

CART 411. *Data Handling and Computer Graphics for Mapping.* ★3 (First Term, 1-0-3). Data compaction and automatic generalization of line and aerial data. The use of computers to process, compile and display spatial distributions. Use of canned programs. Evaluation of computer maps in terms of accuracy, graphical and perceptual qualities.

CART 421. *Cartographic Editing.* ★3 (First Term, 3-0-0). Cartographic documentation. Canadian and foreign mapping agencies. Editorial, planning and management aspects of cartography. Design of geographic atlases. Administration of cartographic laboratories. Production planning and quality control. Small projects. Prerequisite: CART 341 or 411.

CART 431. *Workshop in Cartographic Reproduction.* ★3 (Second Term, 1-0-3). Organization of complex artwork for monochromatic and multicolor map production. Color separation drawing. Color separation photography. Tint screens. Proofing systems and printing. Prerequisite: CART 341 or 411 and 421.

CART 451. *Analytical Cartography.* ★3 (Second Term, 3-0-0). Study of the process of systematic transformation of one regular surface onto another, including the analysis of the concomitant distortions. Coordinate systems and their properties. 2D and 3D Computer mapping. Automatic contouring. Trend surfaces. Pattern analysis and Spatial autocorrelation. Prerequisite: either CART 341 or 411; and working knowledge of a computer language, geometry and statistics.

CART 461. *History of Map Making.* ★3 (Second Term, 3-0-0). The art and science of map making from the classical period to the present, including Canadian cartography and World Cartography. Prerequisite: Either CART 341 or 411. (CART 451 and 461 will be offered in alternate years.)

CART 511. *Problems in Cartography.* ★3 (First Term, 0-3s-0). A proseminar with concentration on a particular topic of importance in cartography, such as generalization, landform representation, perception, lettering, a historical period, etc. Prerequisite: CART 341 or 411.

CART 521. *Proseminar in Cartography.* ★3 (Second Term, 0-3s-0). Survey of cartography as a field of study and its broad divisions and literature; practice in the formulation, presentation, design and criticism of research projects. Prerequisite: CART 341 or 411 and any other course in Cartography.

CART 601. *Advanced Cartography.* ★3 or ★6.

184.8 Chemistry

CHEM 100. *Introductory General Chemistry.* ★6 (3-0-3). A beginning course in chemistry. It includes the topics of high school chemistry but is given from a more advanced point of view. This course may not be taken for credit by students who have credit in Grade XII Chemistry 30.

CHEM 200. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: CHEM 100, or Chemistry 30, or equivalent.

CHEM 202. *Introductory University Chemistry.* ★6 (3-1s-3). Bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics with applications to inorganic chemistry; but designed for students who are taking, or have taken, a university level mathematics course. Prerequisite: CHEM 100, or Chemistry 30, or equivalent. Corequisite or prerequisite: MATH 202 or 203 or equivalent.

CHEM 250. *Organic Chemistry.* ★6 (3-0-3). The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (e.g., amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: Chemistry 30, or CHEM 100, or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Exceptions to this may be made only if written consent of the Department is obtained.

CHEM 300. *The Development of Chemical Concepts.* ★6 (3-0-0). Historical and philosophical development of chemical concepts, particularly those of weight and energy; industrial chemistry, medicinal chemistry, other special topics. This course is intended to serve as a science option for B.A. students. It may not be used for credit in a B.Sc. program.

CHEM 302. *General Chemistry.* ★6 (3-1s-3). Introductory general chemistry designed for those students with credit in University level introductory organic chemistry. The course covers bonding and structure; chemical and phase equilibria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics with applications of the above theory to selected examples drawn from organic (including some biologically important systems) and inorganic chemistry. Prerequisites: Chemistry 30 (or CHEM 100) and CHEM 250. Recommended pre or corequisite: MATH 202 or 203, and 204 (strongly recommended for those planning to take further courses in Chemistry). Note: Students with credit in CHEM 250 will proceed to CHEM 302. Credit in CHEM 302 will not be granted to students with credit in CHEM 200, CHEM 202 or equivalent.

CHEM 312. *Quantitative Analysis.* ★6 (3-0-6). Principles, methods, and experimental applications emphasizing titrimetry, separations, spectrophotometry and evaluation of experimental data. Includes examples of organic analysis, radiochemistry, atomic absorption spectroscopy, gas chromatography, and use of analytical literature. Prerequisite: CHEM 200 or 202 or 302.

CHEM 330. *Inorganic Chemistry.* ★6 (3-0-3). Underlying principles of the subject followed by a study of the periodic table. Prerequisite: CHEM 200 or 202 or 302.

CHEM 331. *Inorganic Chemistry.* ★3 (Second Term, 3-0-3). Bonding, structure and chemical properties of inorganic compounds with emphasis on the main group elements. Prerequisite or corequisite: CHEM 370 or 372.

CHEM 350. *Organic Chemistry.* ★6 (3-0-3). The study of molecular structure and reactivity of organic compounds of both biological and industrial interest. Special attention is given to the chemistry of polymers, fats, peptides and carbohydrates. Methods of structure determination are discussed. Prerequisite: CHEM 200 or 202 or 302. Note: Students who have obtained credit for CHEM 250, cannot take CHEM 350 for credit.

CHEM 370. *Elementary Physical Chemistry.* ★6 (3-0-3). The laws of thermodynamics; calorimetry; phase equilibrium, chemical equilibrium and solution theory; kinetic-molecular theory; chemical kinetics. This is a terminal course in physical chemistry. Prerequisite: CHEM 200 or 202 or 302; Math 204 or equivalent.

CHEM 372. *Elementary Physical Chemistry.* ★6 (3-0-3). The laws of thermodynamics; calorimetry; phase equilibrium, chemical equilibrium and solution theory; kinetic-molecular theory and statistical chemical thermodynamics. Prerequisites: CHEM 200 or 202 or 302; PHYS 202 or 240. Prerequisite or corequisite: MATH 302 and 303. Note: For Honors and Chemistry Specialization students only, except by consent of the Department.

CHEM 431. *Inorganic Chemistry.* ★3 (First Term, 3-0-3). A continuation of CHEM 331 with emphasis on the transition metals. Prerequisite: CHEM 331.

CHEM 451. *Organic Chemistry.* ★3 (First Term, 3-0-4). Mechanisms and reactions of aromatic and aliphatic compounds. Prerequisite: CHEM 200 or 202 or 302, and 250 or 350.

CHEM 453. *Organic Chemistry.* ★3 (Second Term, 3-0-4). A continuation of CHEM 451. Prerequisite: CHEM 451.

CHEM 471. *Advanced Physical Chemistry.* ★3 (First Term, 3-0-3). Quantum mechanics, atomic theory, spectroscopy and molecular properties and structure. Prerequisites: CHEM 372, MATH 303.

CHEM 473. *Advanced Physical Chemistry.* ★3 (Second Term, 3-0-3). A continuation of CHEM 471. Prerequisite: CHEM 471.

CHEM 501. *Introduction to Chemical Research.* ★3 (either term, 1-0-8). For students in the fourth year of Honors or Specialization Chemistry. Introduction to methods in chemical research. Prerequisite: GPA of at least 7.5 in all chemistry courses.

CHEM 503. *Chemical Research.* ★3 (either term, 0-0-8). Investigational work under the direction of a member of the Department. Prerequisite or corequisite: CHEM 501.

CHEM 505. *Special Topics in Chemistry.* ★3 (either term, 3-0-0).

CHEM 507. *Computing Applications for Chemistry.* ★3 (Second Term, 3-0-3/2).

CHEM 511. *Instrumentation in Chemical Analysis.* ★3 (First Term, 3-0-6). Instrumentation and analytical applications of spectroscopic, chromatographic and electroanalytical methods are discussed and applied in the laboratory. Prerequisites: CHEM 312; 370 or 372; PHYS 333 or 340.

CHEM 513. *Electronics for Scientists.* ★3 (Second Term, 3-0-3). An intensive, practical course with emphasis on basic instrument components, operational amplifiers, digital circuits, and other electronic components of modern research instruments. Prerequisite: Consent of the Department.

CHEM 515. *Analytical Electrochemistry.* ★3 (Second Term, 3-0-0). Theory and application of polarography, potentiometry, cyclic voltammetry, and other modern electroanalytical techniques. Prerequisite: CHEM 511, or consent of the Department.

CHEM 517. *Analytical Spectroscopy.* ★3 (Second Term, 3-0-3). Prerequisite: CHEM 511, or consent of the Department.

CHEM 519. *Advanced Analytical Chemistry.* ★3 (First Term, 3-0-0). Theory and practise of non-instrumental analysis; use of complexation, electron transfer, kinetics, non-aqueous solvents in analysis; separation techniques, including solvent extraction, chromatography, and ion exchange. Prerequisites: CHEM 312, 350, and 370 or 372, or consent of the Department.

CHEM 521. *Analytical Separations.* ★3 (First Term, 3-0-3). Theory and practice of gas and liquid chromatography, solvent extraction, ion exchange, electrophoresis and additional selected techniques. Prerequisites: CHEM 511 and consent of the instructor.

CHEM 533. *Structure in the Solid State.* ★3 (First Term, 3-0-0). An introduction to x-ray crystallography.

CHEM 537. *Transition Metal Chemistry.* ★3 (Second Term, 3-0-0). The synthesis, structures, bonding and reaction mechanisms of classical and organometallic complexes. Prerequisite: CHEM 431.

CHEM 539. *Inorganic Reaction Mechanisms.* ★3 (First Term, 3-0-0). Substitution and electron transfer reactions of transition metal ion compounds. Prerequisite: CHEM 431 or consent of the Department.

CHEM 551. *Qualitative Organic Analysis.* ★3 (First Term, 2-0-6). The application of physical (mainly spectroscopic) methods of identification. Prerequisite: CHEM 453.

CHEM 553. *Chemistry of Carbohydrates.* ★3 (Second Term, 3-0-0). The physical and chemical properties of the carbohydrates and related substances are discussed in terms of conformational analysis and modern reaction theory. An appreciation of the organic chemistry derived from studies of polyoxygenated compounds. Prerequisite or corequisite: CHEM 453.

CHEM 555. *Theoretical Organic Chemistry.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 453.

CHEM 559. *Natural Products.* ★3 (First Term, 3-0-0). Prerequisites: CHEM 453, and 551.

CHEM 561. *Advanced Organic Synthesis.* ★3 (Second Term, 3-0-0). A study of the reactions of organic compounds with emphasis on advanced synthetic methods. Prerequisite: CHEM 453 and consent of the Department.

CHEM 571. *Molecular Spectroscopy and Structure.* ★3 (First Term, 3-0-0). Important aspects of quantum mechanics applied to molecular spectroscopy. Prerequisite: CHEM 473.

CHEM 573. *Kinetics, Surfaces, and Catalysis.* ★3 (Second Term, 3-0-0). Theories of reaction rates, catalysis in chemical reactions, physical chemistry of solids and liquids, surfaces. Prerequisite: CHEM 372, MATH 303, PHYS 333.

CHEM 575. *Magnetic Resonance and its Chemical Applications.* ★3 (First Term, 3-0-0). Quantum mechanics of spin systems; electron and nuclear resonance; relaxation and time-dependent phenomena; chemical applications. Prerequisite: CHEM 473 or consent of the Department.

CHEM 581. *Chemical Thermodynamics.* ★3 (First Term, 3-0-0). A continuation of chemical thermodynamics which enlarges upon the basic material in CHEM 372. Prerequisites: CHEM 372, MATH 303, PHYS 333.

CHEM 585. *Infrared and Raman Spectroscopy.* ★3 (Second Term, 3-0-0). The theory of vibrational spectroscopy. Prerequisite: CHEM 593 or equivalent.

CHEM 587. *Special Topics in Free Radical Chemistry.* ★3 (Second Term, 3-0-0). Prerequisite: CHEM 573. Prerequisite or corequisite: CHEM 593.

CHEM 589. *Statistical Mechanics.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 473 or consent of the Department.

CHEM 591. *Radiation Chemistry.* ★3 (First Term, 3-0-0). Interaction of radiation with matter, kinetics of radiolysis reactions. Prerequisite or corequisite: CHEM 573.

CHEM 593. *Molecular Spectroscopy.* ★3 (First Term, 3-0-0). Use and importance of symmetry and group theory in electronic and vibrational molecular spectroscopy. Prerequisite: CHEM 473.

CHEM 595. *Photochemistry.* ★3 (Second Term, 3-0-0). Prerequisites: CHEM 473 and CHEM 573.

CHEM 602. *Departmental Research Seminar.* ★0 (0-2s-0). Required each year of all graduate students in the Department of Chemistry.

CHEM 604. *Advanced Research Seminar.* ★0 (0-2s-0). Reports on topics related to the fields of specialization of the graduate student. These seminars will be set up by the various staff members as required.

CHEM 619. *Special Topics in Advanced Analytical Chemistry.* ★3 (either term, 3-0-0). Prerequisite: CHEM 511 or consent of the Department.

CHEM 631. *Organometallic Chemistry.* ★3 (Second Term, 3-0-0). Organometallic chemistry of the main group elements. Reactions of the coordinated ligands and catalysis of organometallic complexes. Prerequisite: CHEM 431.

CHEM 635. *Chemistry of the Metal Carbonyls.* ★3 (Second Term, 3-0-0). Selected topics including organometallic compounds, hydrides and metal carbonyls. Prerequisite: CHEM 431, or consent of the Department.

CHEM 637. *Topics in Structural Inorganic Chemistry.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 431, or consent of the Department.

CHEM 641. *X-ray Crystallography.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 533.

CHEM 643. *Chemical Application of Photoelectron Spectroscopy.* ★3 (Second Term, 3-0-0). Photoionization processes, instrumentation and measurement, core-level and valence level of photoionization, photoelectron spectroscopy of the solid state. Prerequisite: Consent of the Department. CHEM 473 and 593 or equivalent recommended.

CHEM 655. *Physical Methods of Organic Chemistry.* ★3 (either term, 3-0-0). Prerequisites: CHEM 551 and 555.

CHEM 657. *Physical Organic Chemistry.* ★3 (First Term, 3-0-0). A continuation of topics discussed in CHEM 555.

CHEM 663. *Heterocyclic Chemistry.* ★3 (First Term, 3-0-0). Syntheses and properties of heterocycles; heterocycles of biological and chemotherapeutic importance. Prerequisite or corequisite: CHEM 551.

CHEM 665. *Chemistry of Nucleosides and Nucleotides.* ★3 (Second Term, 3-0-0). The isolation, structure elucidation, synthesis and reactions of nucleosides and nucleotides. Prerequisite: CHEM 453 or consent of the Department.

CHEM 667. *Free Radical Reactions in Organic Chemistry.* ★3 (Second Term, 3-0-0). Prerequisite: CHEM 555.

CHEM 675. *Magnetic Resonance Spectroscopy.* ★3 (First Term, 3-0-0). Prerequisites: CHEM 575 or consent of the Department.

CHEM 683. *Quantum Chemistry.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 473.

CHEM 684. *Principles of Quantum Mechanics with Chemical Applications.* ★6 (3-0-0). Prerequisites: MATH 302/303; PHYS 340 or 333; and CHEM 473 or consent of the Department.

CHEM 685. *Solution Kinetics.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 573 or consent of the Department.

CHEM 699. *Chemical Applications of Mass Spectrometry.* ★3 (Second Term, 3-0-0).

184.9 Computing Science

Note on credit for introductory Computing Science courses: Credit will be granted for only one of 214, 261, 300, 351 and 357, and for only one of 215 and 352.

CMPUT 214. *Introduction to Computing Science.* ★3 (First Term, 3-0-3). History and application of computers; algorithms; flow diagrams; use of a high level programming language in the solution of elementary numerical and non-numerical problems. Corequisite: MATH 207, 202 or 203 or consent of the Department. See above note on introductory Computing Science courses.

CMPUT 215. *Elementary Data Structures.* ★3 (Second Term, 3-0-3). Representation and manipulation of data structures by a high level language; strings; arrays; linked lists; stacks; queues; trees; applications of data structures. Prerequisite: CMPUT 214. Corequisite: MATH 208 or 204 or consent of the Department. See above note on introductory Computing Science courses.

CMPUT 261. *Introduction to Computation.* ★3 (First Term, 3-0-3). Numbers, algorithms and computers; a simple programming language; number systems and numerals; early calculating devices and techniques. Open only to students in Arts and Education. See above note on introductory Computing Science courses.

CMPUT 262. *Introduction to Computers.* ★3 (Second Term, 3-0-3). Arithmetical and logical machines; Turing machines; electronic computers; programming languages; the electronic revolution; computers and society. Open only to students in Arts and Education. Prerequisite: CMPUT 261. See above note on introductory Computing Science courses.

CMPUT 300. *Problem Solving and Programming.* ★2 (either term, 2-0-2). An introduction to problem solving by computer: analyzing problems; formulating algorithms; programming in FORTRAN IV and APL; and the use of MTS terminals. FORTRAN IV and numerical solution of engineering and scientific problems will be emphasized. See above note on introductory courses in Computing Science.

CMPUT 314. *Foundations of Computing Science.* ★3 (First Term, 3-0-3). Review of sets and relations; digraphs; applications of Boolean algebra; minimization; topological sorting; maximal flow and scheduling network algorithms; paths and cycle algorithms; finite representations of numbers and discrete structures; systematic programming; correctness of programs; algorithms, automata and formal grammars. Prerequisite: CMPUT 215 or 352. Note: Credit will be granted for only one of CMPUT 314 or 364.

CMPUT 315. *Computer Organization and Programming.* ★3 (Second Term, 3-0-3). Computer architecture; physical characteristics of input, output and storage devices; detailed study of an assembler language including macros; subroutines, coroutines and input-output operations; elementary operating systems concepts; programming aids; loaders, assemblers, compilers, program libraries. Prerequisite: CMPUT 215 or 352. Note: Credit will be granted for only one of CMPUT 315 or 365.

CMPUT 316. *Introduction to Numerical Methods.* ★3 (either term, 3-0-3). Errors in computation; polynomial interpolation; solution of non-linear equations; systems of linear equations; numerical solution of ordinary differential equations. Prerequisites: CMPUT 214 or 351; MATH 222 or 281. Corequisite: MATH 302 or 307.

CMPUT 321. *Applied Probability.* ★3 (First Term, 3-0-2). Probability models; distribution of one and two random variables; moment generating functions; specific distributions; uniform, binomial, geometric, Poisson, exponential, normal, etc. Analysis of decision problems; decision conditions and criteria; information and utility in decision making. Various applications are considered with emphasis on the analysis of computer systems; simulation techniques are used and the algorithmic approach is used throughout the course. Computer terminals and APL are used in laboratory periods. Prerequisites: MATH 204 and MATH 221 or equivalents. Corequisite: MATH 302 or 307. See § 182.2 (7) re statistics courses.

CMPUT 322. *Applied Statistics.* ★3 (Second Term, 3-0-2). Sampling distributions; estimation; hypothesis testing; linear regression of two or more random variables; simulation of samples; cost analyses; applications which are primarily of interest to computing scientists. Prerequisite: CMPUT 321. Corequisite: MATH 303.

CMPUT 351. *Elements of Programming I.* ★3 (either term, 3-0-3). Basic programming techniques using a high level language; representation and manipulation of numeric and non-numeric data; survey of computing systems, history and applications. See above note on introductory courses in Computing Science.

CMPUT 352. *Elements of Programming II.* ★3 (Second Term, 3-0-3). Problem solving; organization of data files; representation and manipulation of data structures; interfacing with operating systems; structure of computers; input-output and storage devices; introduction to assembler language programming and other programming languages. Prerequisite: CMPUT 214, 262, 300 or 351. See above note on introductory courses in Computing Science.

CMPUT 357. *Introduction to Computing for Business Applications.* ★3 (Either term 2-0-1). Introduction to programming using a higher-level language; program libraries; simulation; computer-oriented systems, and the management decision-making process. Formerly MGTSC 357. See above note on introductory courses in Computing Science.

CMPUT 364. *Combinatorial Computing.* ★3 (First Term, 3-0-3). Review of sets and relations; finite representation of numbers and discrete structures; digraphs, topological sorting; maximal flow and scheduling network algorithms; path and cycle algorithms; tree traversal; depth first searching; backtracking; Tarjan's planarity algoriihm; graph isomorphism algorithms. Throughout the course emphasis is placed on the analysis of algorithms and on the choice of data structures for their implementation. Prerequisite: CMPUT 215. Note: Open to Honors Computing Science students only or by consent of the Department. Note: Credit will be granted for only one of CMPUT 314 or 364.

CMPUT 365. *Computer Organization and Programming.* ★3 (Second Term, 3-0-3). Computer architecture; introduction to logical design and microprogramming; physical characteristics of input, output and storage devices; memory technology and organizations; addressing structures including paging and segmentation; interrupt mechanisms; channels and asynchronous input and output; a detailed study of assembler language including macros; sub-routines; input-output operations; elementary operating systems concepts. Prerequisite: CMPUT 215. Note: Open to Honors Computing Science students only or by consent of the Department. Note: Credit will be granted for only one of CMPUT 315 or 365.

CMPUT 412. *Introduction to Minicomputers.* ★3 (either term, 3-0-3). Minicomputer characteristics and applications; logic design using current logic components; organizational structure of representative minicomputers; problems of short word lengths and small memories; timing and control of asynchronous I/O; applications in data communication and control; laboratory investigation of specific minicomputers. Prerequisite: CMPUT 315 or 365.

CMPUT 413. *Telecommunications and Computers.* ★3 (First Term, 3-0-0). Basic telephony and telegraphy; data transmission techniques; online terminals; communication control; message handling; regulatory aspects. Prerequisite: CMPUT 315 or 365.

CMPUT 414. *Programming Languages.* ★3 (First Term, 3-0-1). Formal definition of programming languages; introduction to syntax analysis; properties of algorithmic languages; list processing languages; run-time representation of program and data structures. Prerequisite: CMPUT 314/315 or 364/365.

CMPUT 415. *Compiler Construction.* ★3 (Second Term, 3-0-0). Two-pass and one-pass assembler construction; review of table-handling techniques; overall compiler organization; common methods for translation optimization and code generation; syntax-directed translation. Prerequisite: CMPUT 414.

CMPUT 416. *Systems Programming.* ★3 (Second Term, 3-0-2). Detailed study of assembler language facilities under a large-scale operating system; data management; task management; job management; loading and subroutine linkage; input-output and channel programming and hardware. Prerequisite: CMPUT 314 / 315 or 364 / 365.

CMPUT 417. *Basic File Management.* ★3 (Second Term, 3-0-0). The use of computers for file management and associated automatic information processing with concurrent study of and practice with the COBOL language. Prerequisite: CMPUT 315 or 365.

CMPUT 418. *Numerical Analysis I.* ★3 (First Term, 3-0-0). Numerical methods for determining eigenvalues and eigenvectors; Gerschgorin's theorem; Jacobi's method; Given's methods; Householder's method. Review of Gauss-Seidel and point Jacobi methods; successive over relaxation methods; estimation of optimal relaxation parameters. Orthogonal polynomials; spline approximations; trigonometric approximations; gradient methods and directed search. Prerequisites: CMPUT 316, MATH 303 or 308.

CMPUT 419. *Numerical Analysis II.* ★3 (Second Term, 3-0-0). Numerical methods for the integration of single and multiple integrals, periodic functions, singular functions; Monte Carlo methods. Numerical solution of differential equations; stability and consistency of multistep methods; stiff systems; two point boundary value problems; partial differential equations; finite difference formulas and stability of methods. Prerequisite: CMPUT 418 or 458 and consent of the Department.

CMPUT 421. *Simulation.* ★3 (Second Term, 3-0-0). Introduction to systems, models and system simulation; discrete event digital simulation with queueing model examples; pseudorandom number generation and testing; generation of random variables; exponential gamma, Weibull, lognormal, binomial, Poisson, geometric, etc. Cost analyses of simulation techniques; variance reduction methods. Brief introduction to series of events and autocorrelation functions. Simulation languages. Prerequisite: CMPUT 322 or equivalent.

CMPUT 458. *Numerical Analysis.* ★3 (either term, 3-0-0). An introduction to numerical methods with engineering applications. Topics include solution of nonlinear equations, interpolation, integration, matrix methods, and ordinary differential equations. Prerequisites: CMPUT 300 or equivalent; MATH 312 and 313.

CMPUT 462. *Switching Theory and Logical Design.* ★3 (Second Term, 3-0-3). Codes; synthesis of gate networks; simplification of combinatorial networks; fault detection; reliability; threshold logic; synchronous and asynchronous sequential machines; minimization. Prerequisite: CMPUT 315 or 365, or equivalent.

CMPUT 463. *Structure of Digital Machines.* ★3 (Second Term, 3-0-3). Functional organization; representation of data; digital arithmetic; input-output facilities; storage elements; central processing units; system organization; description and simulation. Prerequisite: CMPUT 462.

CMPUT 464. *Introduction to Adaptive Systems.* ★3 (First Term, 3-0-0). Finite and infinite automata; information theory; brain models and genetic systems; introduction to artificial intelligence. Prequisite: CMPUT 314 or 364.

CMPUT 465. *Threshold Logic and Learning Machines.* ★3 (Second Term, 3-0-0). Linear separation; characterization and properties of threshold functions, realization of threshold functions; synthesis of threshold-logic networks; discriminant functions and training procedures for learning machines; perceptrons and other pattern recognition models. Prerequisite: CMPUT 462.

CMPUT 472. *Theory of Computation I.* ★3 (First Term, 3-0-0). Effective procedures; simple programming languages; computable functions; recursive functions; Turing machines; semi-computable predicates; computing science — its definition and development. Prerequisite: CMPUT 314 or 364.

CMPUT 501. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 502. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 503. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 504. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 505. *Analysis of Algorithms.* ★3 (Second Term, 3-0-0). Topics selected from: Models of computation. Design of efficient algorithms. Sorting and order statistics. Data structures for set manipulation problems. Algorithms on graphs. Matrix multiplications and related operations. The fast Fourier transform and its applications. Pattern matching algorithms. NP complete problems and approximation algorithms. Prerequisite: Graduate standing or Honors students with CMPUT 472. Note: All graduate students are required to obtain credit in this course.

CMPUT 506. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 507. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 508. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 509. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 511. *Computer Graphics.* ★3 (First Term, 3-0-0). Plotters, graphical displays and picture scanners; encoding methods for graphical data; compound data structures and graphical list processors; current attempts at picture grammars. Prerequisite: CMPUT 315 or 365 or consent of the Department.

CMPUT 512. *Minicomputer Systems and Architectures.* ★3 (Second Term, 3-0-3). Advanced minicomputer projects course involving the following: Minicomputer interface design, construction, and programming. Computer network design and protocol specification. Microprogramming and emulation. Diagnostic techniques. Minicomputer systems design and applications. Prerequisites: CMPUT 365 or 412, and 462.

CMPUT 516. *Computer Systems I.* ★3 (First Term, 3-0-0). Evaluation and comparison of computer systems, with emphasis on virtual memory and hierarchical memory techniques. Prerequisite: CMPUT 416, or equivalent systems programming experience.

CMPUT 517. *Computer Systems II.* ★3 (Second Term, 3-0-0). The study of operating system practices and techniques via a term project. Prerequisite: CMPUT 516.

CMPUT 518. *Matrix Computations I.* ★3 (First Term, 3-0-0). Elimination methods; roundoff analysis and conditioning; norms; a posteriori error bounds; iterative methods for solving large-scale linear systems; practical implementation of algorithms; comparison of methods. Prerequisite: CMPUT 419.

CMPUT 519. *Matrix Computations II.* ★3 (Second Term, 3-0-0). Error analyses of methods for finding eigenvalues and eigenvectors of symmetric matrices; norms; a posteriori error bounds; perturbation theory of eigenvalues; practical assessment of answers; QR and LR algorithms; shift of origin techniques. Prerequisite: CMPUT 419.

CMPUT 521. *Time Series Analysis I.* ★3 (Second Term, 3-0-0). Classification of random processes; stationarity; imbedded Markov chains; generating functions; Laplace transforms of distribution functions; priority and nonpriority queueing systems; scheduling algorithms; applications primarily pertaining to computer systems and communication networks. Prerequisites: CMPUT 316 and 322, or consent of the Department. Offered alternate years with CMPUT 522.

CMPUT 522. *Time Series Analysis II.* ★3 (First Term, 3-0-0). Time series models for computer systems; samples of computer system observations; analysis and estimation of autocovariance and autocorrelation functions; time series models are developed from real data; hence, emphasis is on data analysis and model building for real-life applications. Prerequisite: CMPUT 316 and 322, or consent of the Department. Offered alternate years with CMPUT 521.

CMPUT 525. *Formal Syntax Analysis.* ★3 (First Term, 3-0-0). Context-free grammars and other formalisms for describing syntax of programming languages. Regular grammars and finite state automata. Top-down and bottom-up parsing of context-free languages. Early's context-free parser. Precedence, LL(k), and LR(k) grammars. SLR(k), LALR(k), L(m)R(k) and LR(k) parsing techniques. Transduction grammars. Problems of imbedding parsers into compilers. Error-recovery techniques. Prerequisite: CMPUT 415, or consent of the Department.

CMPUT 530. *Advanced Compiler Construction.* ★3 (First Term, 3-0-0). Memory allocation for object programs, stacks and free-storage disciplines; garbage collection; parameter mechanisms; general compiler organization; symbol tables; code generation; global and peephole optimization tech-

niques; compile-time and run-time diagnostic facilities. Prerequisite: CMPUT 525, or consent of the Department.

CMPUT 551. *Artificial Intelligence I.* ★3 (First Term, 3-0-0). LISP, typology of problems and games, algorithms for state-space and problem-reduction search, deductive problem-solving and question-answering, plan formation and generalization, higher-level planning, planning languages, skill acquisition, program synthesis, representing prodedural and declarative knowledge, hierarchies, production systems, expert systems, control issues. Prerequisite: CMPUT 464 or consent of the Department.

CMPUT 552. *Artificial Intelligence II.* ★3 (Second Term, 3-0-0). Computational methods of scene analysis, making analogies and forming concepts, introduction to philosophy of language and computational linguistics, early work and fundamental problems in machine comprehension of natural language, the work of Winograd, Woods, Schank and his associates, Wilks, Marcus, and others, natural language data base access, speech processing. Prerequisite: CMPUT 551.

CMPUT 555. *Computing in Biological Systems.* ★3 (Second Term, 3-0-0). An introduction to biological mechanisms of information processing, memory, adaptation and learning with emphasis on genetic and neural systems; modelling and simulation of biological systems. Prerequisite: CMPUT 464 or consent of the Department.

CMPUT 565. *Data Structures.* ★3 (Second Term, 3-0-0). Advanced data structures and algorithms for manipulating them. In particular, binary trees, balanced trees and B-trees will be discussed in depth. Languages for processing lists and trees; applications to sorting and searching. Prerequisite: CMPUT 414.

CMPUT 566. *Algebraic and Symbolic Manipulation.* ★3 (Second Term, 3-0-0). Representation of expressions; simplification; symbolic languages; multiple-precision arithmetic; fast Fourier transforms; modular arithmetic; Chinese remainder and interpolation algorithms; greatest common divisor algorithms; multivariate systems of equations; polynomial resultants; rational function manipulation, sequence prediction; automatic differentiation and integration. Prerequisites: CMPUT 314 or 364 and MATH 282 or 328. Corequisite: MATH 416 or 425.

CMPUT 571. *Sequential Machines.* ★3 (Second Term, 3-0-0). Characterization and representation of finite state automata; state and machine equivalence; analysis and synthesis; state assignment; decomposition; feedback and errors; identification, introduction to linear machines and feedback shift registers. Prerequisite: CMPUT 462 or 464.

CMPUT 572. *Theory of Computation II.* ★3 (Second Term, 3-0-0). Primitive recursive functions, Turing machines, recursive functions, unsolvable problems, recursive and recursively enumerable sets, reducibility, space and time complexities, time and space hierarchies, machine independent theory of complexity, NP-complete problems. Prerequisite: CMPUT 464 or 472 or consent of the Department.

CMPUT 591. *Information Storage and Retrieval I.* ★3 (First Term, 3-0-0). The basic problems and terminology of information storage and retrieval. Sequential, chained, inverted, computed-access, and clustered files; automatic content analysis of texts; classification techniques; construction of thesauri based on co-occurrences and pseudo-classification; polynomial complete problems. Prerequisite: CMPUT 314/315 or 364/365, or equivalent.

CMPUT 592. *Data Base Management.* ★3 (Second Term, 3-0-0). Relational, network and hierarchical data models; sequential, indexed sequential, inverted, multi-lists, computed access and cluster files; external sorting algorithms; secondary indices optimization; security; decomposition of query; differential files; evaluation of file organizations; current literature. Prerequisite: CMPUT 417 or consent of the instructor.

CMPUT 618. *Ordinary Differential Equations.* ★3 (First Term, 3-0-0).

CMPUT 619. *Partial Differential Equations.* ★3 (Second Term, 3-0-0).

CMPUT 651. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 652. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 653. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 654. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 660. *Seminar on Computer Systems Evaluation.* ★3 (First term, 3-0-0).

CMPUT 661. *Seminar on Software Engineering.* ★3 (Second Term, 3-0-0).

CMPUT 662. *Advanced Topics in Sequential Machines.* ★3 (Second Term, 3-0-0).

CMPUT 663. *Advanced Topics in Automata and Computability.* ★3 (First Term, 3-0-0).

CMPUT 665. *Seminar in Artificial Intelligence.* ★3 (Second Term, 3-0-0).

CMPUT 666. *Seminar in Adaptive Systems.* ★3 (First Term, 3-0-0).

CMPUT 670. *Coding and Storage in Information Retrieval.* ★3 (First Term, 3-0-0).

CMPUT 671. *Classification Problems in Information Retrieval.* ★3 (Second Term, 3-0-0).

CMPUT 900. *Non-Thesis Project.* ★3 (variable).

184.10 Entomology

ENT 207. *Agricultural Entomology.* ★3 (either term, 3-0-3) Introduction to insects and related arthropods emphasizing those aspects of their structure and life history responsible for some of them becoming pests and indicating those aspects towards which control measures can be directed. Principles of integrated control. Prerequisites: Biology 30 or BIOL 130 or equivalent recommended.

ENT 209. *Entomology for Non-Biologists.* ★3 (either term, 3-0-3) Comparisons of the structure, relationships, behavior and place in nature of insects and man. No prerequisite.

ENT 302. *Survey of Entomology.* ★3 (First Term, 3-0-3). An examination of the world of insects from the point of view of major areas of entomological study including life histories, behavior, taxonomy and phylogeny, physiology, development, morphology and ecology. Emphasis is given to the study of insects as animals not to the study of insects as pests. Prerequisite: Biology 30 or BIOL 130; ZOOL 353 or ENT 207 recommended.

ENT 317. *Comparative Morphology.* ★4 (First Term, 3-0-6) Comparative morphology of the major orders of insects and the evolution of some of their structures. Prerequisite: ZOOL 352/353.

ENT 392. *Medical and Veterinary Entomology.* ★3 (either term, 3-0-3). An introduction to the arthropods and an account of their influences on the health of man and other animals. Prerequisite: Biology 30 or BIOL 130 or equivalent. Not open to students with credit in ENT 492.

ENT 401. *Project in Basic Entomology.* Weight according to work done to a maximum of ★6. Individual study. Course object: provide the student with the opportunity to investigate through guided reading and discussion with a faculty member of the student's choice, the literature on one or more topics in basic entomology. According to circumstances and inclinations, limited experimental work might be undertaken.

ENT 407. *Principles of Insect Pest Management.* ★3 (Second Term, 3-1s-0). The ecological, economic and tactical concepts involved in insect pest management. Prerequisite: Any entomology course or ZOOL 352, 353 or FOR 380.

ENT 419. *Insect Development.* ★3 (Second Term, 3-0-3) Reproduction, embryonic and postembryonic development of insects. Prerequisite: Consent of instructor; ENT 317 recommended.

ENT 427. *Insect Taxonomy.* ★4 (First Term, 2-0-6). The higher taxa of insects and their relationships. Practice in identification. Prerequisite: Consent of instructor; ENT 317 and 419 recommended.

ENT 450. *Insect Biochemistry.* ★3 (Second Term, 3-0-3) Comparative biochemistry of insects emphasizing processes which are characteristic of insects. Prerequisites: BIOCH 371 or 372, or PL SC 431 and 432, ENT 207 or 302 recommended.

ENT 471. *Project in Applied Entomology.* Weight according to work done to a maximum of ★6. A survey of the literature on one or more topics in applied entomology with or without experimental study of related simple problems.

ENT 476. *Insect Toxicology.* ★3 (Second Term, 3-0-3). Survey of present and prospective chemical insect control agents. Chemistry, mode of action, metabolism, environmental impact and hazards to man of insecticides, repellants, microbial agents, chemosterilants, insect growth regulators and chemicals which influence insect behaviour. Prerequisites: One of ENT 207, 302, 392, 480, 492 or FOR 380 and CHEM 250.

ENT 480. *Forest Entomology.* ★3 (either term, 3-1s-2). Characteristics of major North American forest insects. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. This course is intended for honors and graduate students in Entomology or any other biological science. A term paper is required. Given concurrently with FOR 380. Prerequisite: Biology 30 or BIOL 130 or equivalent. Not open to students with credit in FOR 380.

ENT 492. *Medical and Veterinary Entomology.* ★3 (either term, 3-1s-3). This course is Entomology 392 plus readings and discussion of topics of current interest. Prerequisite: Consent of instructor. Not open to students with credit in ENT 392.

ENT 527. *Insect Taxonomy.* ★3 (Second Term, 3-0-3). Literature of insect taxonomy. Principles and procedures. Speciation, phylogeny and zoogeography. Preparation of taxonomic papers. Prerequisite: Consent of instructor; ENT 427 recommended.

ENT 556. *Insect Physiology.* ★4 (Second Term, 2-0-5). Life processes illustrated by insects with emphasis on those peculiar to them and their relatives. Prerequisite: Consent of instructor; a senior physiology course recommended.

ENT 560. *Insect Ecology.* ★4 (First Term, 2-0-6). Relationships of insects to their environment. Community interactions. Laboratory will consist of field trips. Prerequisite: ENT 207 or 302 recommended.

ENT 561. *Advanced Insect Ecology.* ★4 (Second Term, 2-0-6). Behavioral aspects of insect ecology. Responses of insects to the biological and physical environment. Circadian activity rhythms. Prerequisite: ENT 560 recommended.

ENT 601. *Seminar.* ★2 (First Term, 0-2s-0). Required of all graduate students in each year.

ENT 602. *Seminar.* ★2 (Second Term, 0-2s-0). Required of all graduate students in each year.

ENT 610. *Project in Insect Morphology and Histology.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of the instructor.

ENT 621. *Project in Insect Taxonomy.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of the instructor.

ENT 650. *Project in Insect Physiology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 450 or 556.

ENT 660. *Project in Insect Ecology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 560 or 561 recommended.

ENT 670. *Project in Insect Toxicology.* Weight according to work done to a maximum of ★6. Prerequisite: ENT 476.

ENT 680. *Project in Forest Entomology.* Weight according to work done to a maximum of ★6. Prerequisite: FOR 380 or ENT 480 recommended.

ENT 692. *Project in Medical Entomology.* Weight according to work done to a maximum of ★6. Prerequisite: Consent of the instructor.

184.11 Genetics

NOTE: See also BIOL 297 listed under Biology, § 184.5 above.

GENET 351. *Principles of Genetics.* ★6 (3-0-3). Physical basis of heredity; transmission genetics in eukaryotes (plants and animals) and prokaryotes (bacteria and viruses); gene structure; gene mutations; human genetics; gene action at the molecular, biochemical and developmental levels; genetic coding; cytoplasmic inheritance; sex determination; polyploidy, aneuploidy and chromosomal aberrations. Prerequisite: Biology 30 or BIOL 130, or consent of the Department. Note: Students cannot receive credit for both BIOL 297 and GENET 351.

GENET 365. *Human Genetics.* ★3 (First Term, 3-0-0). Introduction to human genetic variability. Topics will be drawn from the areas of medical genetics, social problems in genetic perspective, and population genetics. Prerequisite: BIOL 297.

GENET 370. *Foundations of Molecular Genetics.* ★3 (First Term, 3-0-0). Basic concepts on the organization of genetic material and its expression will be developed from experiments on bacteria and viruses. Prerequisite: BIOL 297.

GENET 375. *Eukaryote Genetics and Cytogenetics.* ★3 (Second Term, 3-0-3). A comprehensive discussion of Mendelian and neo-Mendelian inheritance, chromosome behavior and their interrelationships. Prerequisite: BIOL 297.

GENET 380. *Basic Population Genetics.* ★3 (First Term, 3-0-3). Introduction to the genetics of evolutionary processes in experimental and natural populations. The laboratory periods are used to discuss recent papers in population genetics. Prerequisite: BIOL 297 or GENET 351 or consent of the Department.

GENET 410. *The Genetics of Industrially Important Fungi.* ★3 (Second Term, 3-0-0). An advanced lecture course dealing with genetic incompatibility systems, somatic recombination and genetic aspects of fungal differentiation as they relate to the improvement of those fungi of interest to industrial microbiology and applied genetics. Prerequisites: BIOL 297 and GENET 375 or GENET 351 or equivalent.

GENET 415. *Cytogenetics.* ★3 (Second Term, 3-2s-0). Advanced topics in cytogenetics: chromosome nature, replication, structure; chromosome aberrations; aneuploidy; polyploidy; karyotype evolution; sex determination and evolution of sex-determining systems; balanced lethal systems and *Oenothera* cytogenetics; somatic-cell genetics; dosage compensation; position effects. Prerequisite: GENET 351 or 375 or equivalent.

GENET 419. *Quantitative Genetics.* ★3 (Second Term, 3-0-0). The study of quantitative and polygenic inheritance. Mathematical and statistical analyses of the phenomena. Prerequisite: GENET 380 or consent of the Department.

GENET 430. *Recombination and Mutation.* ★3 (First Term, 3-2s-0). Inter- and intragenic recombination; spontaneous and induced mutation in the lower eukaryotes. Prerequisite: GENET 370 or 351, or consent of the Department.

GENET 445. *Molecular Genetics.* ★3 (Second Term, 3-0-0). Molecular mechanism of gene expression and regulation. Emphasis on bacterial plasmids and bacteriophages. Prerequisite: GENET 370 or GENET 351.

GENET 452. *Radiation Genetics.* ★3 (Second Term, 3-0-0). The course aims at introducing the student to the methods of thought and experiment used in molecular radiation biology as well as to the results obtained thereby. Prerequisite: GENET 370 or 351 or consent of the Department.

GENET 463. *Genetic Improvement of Cultivated Plants.* ★3 (Second Term, 3-0-0). Covering genetic principles involved, domestication, controlled evolution, polyploidy and heterosis. Prerequisite: BIOL 297 or GENET 351 or consent of the Department.

GENET 465. *Human Population Genetics.* ★3 (Second Term, 3-1s-0). A survey of empirical studies of variation in human populations with emphasis on biochemical genetics. Topics include polymorphisms, ethnic variation of disease, admixture, and molecular population genetics. Prerequisite: GENET 380 or consent of the Department.

GENET 470. *Immunogenetics.* ★3 (First Term, 3-0-0). The inheritance of cell characters identifiable as antigens. The ontogeny and expression of cell antigens. Physiological and biochemical characteristics linked to cell antigens. Experimental and natural chimaerism in chordates. Prerequisite: GENET 351 or 370 or consent of the Department.

GENET 481. *Population Genetics.* ★3 (Second Term, 3-2s-0). The genetic structure of natural populations. Equal emphasis on mathematical theory and data from natural and experimental populations. Prerequisite: GENET 380 or consent of the Department.

GENET 486. *Developmental and Physiological Genetics.* ★3 (First Term, 3-1s-0). A discussion of the involvement of genes in physiological and developmental processes, particularly in eukaryotes. Prerequisite: GENET 370 and 375 or 351 or consent of the Department.

GENET 506. *Reading Project.* ★3. Directed reading and essays carried out in conjunction with an assigned faculty member. Note: A student may obtain credit in this course more than once (however, see Honors § 183.8.1). Students not in the Genetics Honors Program must obtain prior consent of the Department.

GENET 507. *Research Project.* ★3. (0-0-6).Directed laboratory research culminating in a report and oral presentation. Carried out in conjunction with an assigned faculty member. Note: A student may obtain credit in this course more than once (however, see Honors § 183.8.1). Students not in the Genetics Honors Program must obtain prior consent of the Department.

GENET 511. *Cytology.* ★3 (First Term, 3-0-0). Advanced cytological techniques, together with a detailed treatment of selected topics dealing with cellular structure, ultrastructure and function. Prerequisites: GENET 370 or 375 or 351 or equivalent or consent of the Department.

GENET 520. *Research Techniques in Molecular Genetics.* ★6 (Second Term, 0-0-6). A laboratory course offered to senior undergraduates and graduate students in biology. Emphasis on modern techniques in bacterial and phage genetics as applied to the Lactose operon of *Escherichia coli*, restriction analysis of DNA, and plasmid construction by *in vitro* recombinant DNA techniques. Prerequisite or corequisite: GENET 445.

GENET 521. *Research Techniques in Classical and Molecular Cytogenetics.* ★6 (Second Term, 0-0-6). A laboratory course offered to senior undergraduate and graduate students in biology. Laboratory work will involve techniques used in the analysis of eukaryotic chromosome structure and function. Prerequisite: GENET 415 or GENET 486 or consent of the Department.

GENET 546. *Current Topics in Molecular Genetics.* ★3 (Second Term, 3-0-0). Discussion of current problems related to gene action. Prerequisite: Consent of the Department.

GENET 581. *Topics in Population Genetics.* ★3 (Second Term, 3-0-0). A different topic of current interest will be covered each time the course is offered. The course may therefore be repeated for credit. Prerequisite: GENET 481 or consent of the Department.

GENET 587. *Genetics and Development.* ★3 (Second Term, 3-0-0). Advanced discussion of selected topics on the functional organization of the genome as it relates to development in multi-cellular organisms. Prerequisite: GENET 486 or consent of the Department.

GENET 601. *Genetics Seminars.* ★6 (0-1s-0).

NOTE: Not all graduate courses are offered every year.

184.12 Geography

NOTE: STUDENTS ARE RESPONSIBLE FOR THEIR OWN ACCOMMODATION AND MEAL EXPENSES FOR THE FOLLOWING GEOGRAPHY COURSES WHICH INVOLVE OVERNIGHT FIELD TRIPS: 309, 438, 439, 465, 509, 530, 531, 532, 535, AND 536. STUDENTS WILL BE CHARGED AN ADDITIONAL $2.00 TO COVER THE COST OF TRANSPORTATION ON FIELD TRIPS ASSOCIATED WITH GEOG 230/231.

NOTE: Description of Geography 200 and other Geography courses and Interdisciplinary courses considered to be Arts courses will be found in the Faculty of Arts section of the Calendar. (§ 44.16 above). Courses in Cartography and Meteorology offered within the Geography Department are listed separately in § § 184.7 and 184.21.

NOTE: Geography 230 and 231 do not have to be taken in sequence. They are completely separate courses. Either one may be taken without the other, and Geography 231 can be taken before Geography 230.

GEOG 230. *Introductory Physical Geography I.* ★3 (either term, 3-0-2). Introducton to geomorphology: the nature and formation of major landform features of the earth's surface. Rock weathering and slope movements. Landforms developed by erosional and depositional processes of rivers, glaciers, winds, waves and currents. A field trip in the Edmonton area may by offered. Laboratory work required.

GEOG 231. *Introductory Physical Geography II.* ★3 (either term, 3-0-2). Introduction to the atmosphere and biosphere. Physical elements of weather and climate. Causes, changes and patterns of weather. Climatic classification. Spatial and dynamic interrelations of climate, soils and vegetation. Laboratory work required. Note: GEOG 230 does not have to precede GEOG 231.

GEOG 309. *Intermediate Physical Geography.* ★6 (3-0-3). Climate, vegetation, soil, water and landforms with stress upon local, regional and world patterns of each. Field work required. Prerequisite: GEOG 230 or 231.

GEOG 317. *Aerial Photographic Interpretation in Geography.* ★3 (Second Term, 1-0-3). Introduction to the interpretation of aerial photographs including landforms, soils, vegetation, hydrography, agricultural and urban systems, resources, communications and recreation. Particular stress on Albertan and Canadian examples. Field trips may be required. Prerequisite: GEOG 230 or equivalent or consent of the instructor.

GEOG 329. *Introduction to Research Methods.* ★3 (First Term, 3-0-2). Introduction to quantitative methods, sampling and questionnaire design, and their application to geographic problems. Field projects will be included.

GEOG 333. *Introduction to Weather.* ★3 (First Term, 3-0-0). A survey of weather processes and phenomena; radiation, temperature, moisture, winds, clouds, storms. Precipitation processes. Weather analysis and forecasting. Urban weather. Weather and modification. Laboratory assignments include analyses of weather maps and thermodynamic charts. Field trips. Note: A student cannot receive credit for both GEOG 333 and METEO 307. Students are strongly advised to precede GEOG 333 with GEOG 231.

GEOG 334. *Introduction to Climate.* ★3 (Second Term, 3-0-0). A survey of climatology. Climatic classification. Climate of the continents. Some considerations of climatic changes. Interaction of climate and biosphere with emphasis on man. Laboratory assignments include interpretation of climatic data. Prerequisite: GEOG 333.

GEOG 336. *Environment Alberta.* ★3 (either term, 3-0-0). The physical environment of Alberta. Regional variation in the patterns of climate, landforms, water, soils, vegetation and wildlife; the geographic synthesis of these patterns to give a broad understanding and appreciation of the province and its environmental problems.

GEOG 429. *Intermediate Research Methods.* ★3 (Second Term, 3-0-2). Application of quantitative methods to geographic problems. Corequisite: GEOG 329 and STAT 241 or 255.

GEOG 430. *Fluvial Geomorphology.* ★3 (First Term, 0-3s-0). Analysis of river behavior, channel processes and fluvial landforms. Field work required. Prerequisite: GEOG 309 or GEOL 380 or consent of the instructor.

GEOG 433. *Microclimatology.* ★3 (Second Term, 3-0-0). The climate of the lowest layers of the atmosphere. The relation of microclimatology to topography, plant and animal habitat, and man.

GEOG 437. *Physical Geography of Arid Lands.* ★3 (First Term, 3-0-0). A systematic and regional survey of the physical features of the world's dry lands in the low and mid-latitudes. Prerequisite: GEOG 230 or 231.

GEOG 438. *Mountain Geomorphology.* ★3 (First Term, 3-0-0). Analysis of the major landforms and geomorphic processes in mountain areas. Topics will include glaciers, avalanches, action of running water, periglacial and mass-wasting processes. Field trips may be required. Prerequisite: GEOG 230 or equivalent.

GEOG 439. *Environmental Hazards.* ★3 (Second Term, 0-3s-0). Analysis of natural hazards presented to man by the physical environment. Topics will include floods, earth dynamics, mass movements, avalanches, drought, and violent storms. Prerequisite: GEOG 230, or equivalent.

GEOG 445. *Northern Lands I.* ★3 (First Term, 3-0-0). A synthesis of the physical geography of northern Canada with comparisons to other circumpolar lands. Emphasis on events and processes which have formed the northern landscape. Includes such topics as climate/climatic change, permafrost, glaciation and sea ice. Prerequisite: GEOG 230 or 231, or consent of the instructor.

GEOG 465. *Boreal Ecology I.* ★3 (First Term, 3-0-3). Physical environment of the boreal region: climatic processes (emphasizing winter conditions); regional physiography (especially glaciation, periglacial geomorphology, permafrost and soils); environmental modification by man. Laboratory will consist of field studies. Prerequisite: Consent of the instructor. Note: Boreal Ecology II appears as ZOOL 466.

GEOG 466. *Boreal Ecology I.* ★3 (First Term, 3-0-0). The lecture portion of GEOG 465.

GEOG 468. *The Physical Geography of Water Resources.* ★3 (First Term, 3-0-0). Local, regional, and world patterns of water supply. Precipitation, evapotranspiration, streamflow, soil moisture, groundwater, and their relationships in water balance.

GEOG 469. *The Geography of Water Management.* ★3 (Second Term, 3-0-0). Man's decisions about water examined in the light of economic, political, and environmental conditions. Regional differences in management patterns and decisions. The role of technology in creating new opportunities and new problems. There is no prerequisite but students are urged to have taken GEOG 468.

GEOG 498. *Honors Seminar.* ★3 (First Term, 0-3s-0). Problems in contemporary geographic theory and practice.

GEOG 500. *History and Nature of Geography.* ★3 (Second Term, 0-3s-0).

GEOG 501. *Air Photo Interpretation.* ★6 (3-0-3). Physical and cultural geography depicted on vertical and oblique air photos. Interpretation techniques, field use of photos and the elements of photogrammetry. Prerequisite: GEOG 317 or consent of the Department.

GEOG 502. *Reading and Seminar Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 509. *Field Techniques in Physical Geography.* ★3 (First Term, 0-3s-0).

GEOG 523. *Geographic Theory.* ★3 (First Term, 3-0-0). A consideration of the role of theory in social and physical geographic research. Prerequisite: Consent of the instructor.

GEOG 529. *Application of Quantitative Methods and Computer Programming in Geography.* ★3 (Second Term, 0-3s-0). Prerequisite: GEOG 429 or consent of the instructor.

GEOG 530. *Advanced Fluvial Geomorphology.* ★3 (either term, 0-3s-0). The study of alluvial terrace development and alluvial stratigraphies in a variety of river and stream environments. Strong emphasis is placed on local fieldwork. It is recommended that students audit GEOG 430 if it, or equivalent, has not been taken.

GEOG 531. *Advanced Glacial Geomorphology.* ★3 (either term, 0-3s-0). Prerequisite: A 400-level (or higher) course in geomorphology or consent of the Department.

GEOG 532. *Periglacial Geomorphology.* ★3 (either term, 0-3s-0). The study of cold-climate landforms. Climatic and geomorphic controls. Weathering and slope formation. Landforms developed in permafrost regions, emphasizing patterned ground formation. Periglacial landforms as micro-habitats. Prerequisite: A 400-level (or higher) course in geomorphology or consent of the Department.

GEOG 533. *Climatology.* ★3 (First Term, 3-0-0). The concept of the "normal climate"; Pleistocene climates and the research techniques for their reconstruction; postglacial and recent climatic fluctuations and the general circulation, their influence on plant life; the purpose and success of classification of climates; the concept of potential evapotranspiration; use of climatic knowledge in the service of man — application of Bioclimatology. Prerequisite: Consent of the instructor.

GEOG 534. *Slope Morphology.* ★3 (either term, 0-3s-0). Processes and theories of slope development by surface and subsurface erosion by mass movement. Theoretical, field, and laboratory studies of slope development processes. Field work required. Prerequisite: Consent of the instructor. Offered alternate years.

GEOG 535. *Advanced Northern Lands.* ★3 (Second Term, 0-3s-0). Seminar on the physical geography of the northlands. Prerequisites: GEOG 445/446, GEOG 465, ZOOL 465, or consent of the instructor.

GEOG 536. *Karst Geomorphology.* ★3 (either term, 0-3s-0).

GEOG 537. *Circumpolar Quaternary Climates.* ★3 (Second Term, 0-3s-0). Theories and environmental evidence of climatic change in northern lands in: the Pleistocene, the Holocene, and the recent historical period, with particular emphasis on the instrumental records. Basic review of earth/sun relations, geophysical variables and circulation of the atmosphere. Palaeoclimatic reconstructions of environmental systems including the glacial record, Arctic Ocean cores, ice cores, treeline and sea ice fluctuations, recent climatic (synoptic) records and glacial mass balance studies. Problems of interpretation, sampling, and errors of resolution.

GEOG 539. *Seminar in Natural Hazards.* ★3 (either term, 0-3s-0). An examination of selected topics in natural hazards such as earthquakes, floods, hail, climatic hazards and avalanches. Discussion will centre on the theoretical framework of natural studies and the interaction between natural hazards and society. Prerequisite: GEOG 439 or equivalent.

GEOG 551. *Research in Physical Geography.* ★3 (0-3s-0) or ★6 (0-3s-0).

GEOG 553. *Special Research Problems.* ★3 (0-3s-0) or ★6 (0-3s-0).

GEOG 565. *Environmental Quality.* ★3 (either term, 0-3s-0).

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). An examination of current environmental research in the Canadian North. Seminars are presented by professionals engaged in various facets of northern research. Prerequisite: Consent of the Department. (Offered by the Boreal Institute for Northern Studies and the Department of Geography.) (Students register in the Department of Geography.)

GEOG 568. *Water Resources I.* ★3 (First Term, 0-3s-0). Water supply patterns and problems, emphasizing environmental interrelationships and limitations. Prerequisite: Consent of the instructor.

GEOG 569. *Water Resources II.* ★3 (Second Term, 0-3s-0). Problem analysis approach to water management, emphasizing regional variations in water demand and their implications. Prerequisite: Consent of the instructor. GEOG 568 is not essential but is highly recommended.

GEOG 631. *Advanced Research in Physical Geography.* ★3 (3-0-0) or ★6 (3-0-0).

184.13 Geology

NOTE A: Students are responsible for their own accommodation and meal expenses on all geology field trips.

NOTE B: Certain courses will normally be offered in alternate years when indicated by the symbol "†". If sufficient demand exists, however, exceptions may be made and courses offered in off-cycle years. Students should contact the Department office.

NOTE C: A list of Paleontology courses and course descriptions may be found under § 184.23 Paleontology.

NOTE D: Geology 301, 302, 303, 304, 305, 306, 307 and 308 are intended for students following programs other than Geology. Students in Honors or Specialization programs in Geology, Geology and Physics or Geology and Zoology may not take them without special consent of the Department.

NOTE E: Students without the necessary prerequisites may be admitted to a course under special circumstances providing they obtain the consent of the Department.

NOTE F: Undergraduate students wishing to register in a 600-level course should obtain the consent of the Chairman.

NOTE G: Any two of GEOL 209, 309, 409 and 509 will be counted as a weight of 3 irrespective of the weighting given in the course description.

GEOL 202. *Physical Geology.* ★3 (First Term, 3-0-3). Internal structure and composition of the earth; continents and oceans; minerals and rocks; groundwater and water supply; erosion, transportation and deposition of sediments; igneous activity and metamorphism; mountain building; plate tectonics. Not available to students with credit in GEOL 301 or 390.

GEOL 203. *Earth History.* ★3 (Second Term, 3-0-3). Geological time; fossils; evolution of the principal groups and man; use of fossils in historical geology; paleogeography; historical geology. Not available to students with credit in GEOL 302 or 306. Prerequisite: GEOL 202.

GEOL 209. *Geology Field School I.* ★1. Ten days excursion at the end of the second term to demonstrate the geology of Alberta. Prerequisites: GEOL 202 and 203.

GEOL 300. *Introductory Studies in Geology.* ★3 (0-0-3). Minerals, rocks, fossils and the interpretation of geological maps. Geology 300, 301 and 302 together are considered equivalent to Geology 202 and 203 for prerequisite purposes. Not available to students with credit in Geology 202 and 203. Prerequisites: GEOL 301 and 302.

GEOL 301. *Earth Science I.* ★3 (First Term, 3-0-0). Nature, origin and evolution of the universe and of planetary systems; the physical properties of the earth and of its environment; the materials and structures of the earth's interior and surface and the processes affecting these regions, such as continental drift, the formation of ocean basins and mountain building. Not available to students who have taken GEOL 202, or 390.

GEOL 302. *Earth Science II.* ★3 (Second Term, 3-0-0). The hydrologic cycle and the cycle of erosion; measurement of geologic time; history of life on earth and the geological evolution of North America; glaciation and the ice-age; groundwater and water-supply; nature and origin of mineral deposits; geology of coal, oil and gas; the conservation of natural resources. Not available to students with credit in GEOL 203, or 306. Prerequisite: GEOL 301.

GEOL 303. *Canadian Shield and Arctic.* ★3 (First Term, 3-0-0). Regional geology of the Precambrian rocks; history of discovery of major districts; present development of mineral deposits and future possibilities. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302.

GEOL 304. *Western Canada Plains and Cordillera.* ★3 (Second Term, 3-0-0). Regional geology of interior plains of Western Canada; development of oil, gas and coal deposits; mountain-building and ore deposits from the plains to the Pacific rim. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302.

†GEOL 305. *Environment Earth.* ★3 (First Term, 3-0-0). Early history of the earth; formation of the hydrosphere and atmosphere and their evolution to the present 'stable' state; atmosphere and hydrosphere as solar-powered heat engines; hydrologic cycle, water supply and groundwater; geological factors affecting the disposal of waste; quantitative evaluation of the effects on the environment of man's exploitation and use of mineral resources; future availability of fuel and of metallic minerals; permafrost, exploration and construction; earthquakes and man-made explosions; earth resources; observational satellites. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302.

†GEOL 306. *The Succession of Life Through Geological Time.* ★3 (Second Term, 3-0-0). Nature of the primitive earth and the origin of self-replacing molecules; earth environment and its influence on the development of life; modification of the early environment by developing life forms; nature of the fossil record; sequence of development and interrelationships of the major animal and plant groups. Not available to students with credit in GEOL 203, or 302.

†GEOL 307. *Earth Science III.* ★3 (First Term, 3-0-0). Modern theories of the evolution of the earth, particularly as applied to Western Canada. Impact of current thought on classical geological, scientific and philosophical problems. Prerequisite: GEOL 202 or 301.

†GEOL 308. *Earth's Physical Resources.* ★3 (Second Term, 3-0-0). Resources and resource systems of planet Earth; energy resources and mineral deposits; constructional and other bulk materials; implications of earth resource systems in human affairs. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302.

GEOL 309. *Geology Field School II.* ★2. Ten days geological mapping of slightly deformed sedimentary rocks in the Rocky Mountains. Prerequisites: GEOL 320, 362.

GEOL 310. *Principles of Paleontology.* ★3 (First Term, 3-0-3). Morphology, paleoecology, and evolution of the Porifera, Coelenterata, Brachiopoda, Mollusca, Echinodermata, and Trilobita. Prerequisites: GEOL 202 and 203.

GEOL 320. *Principles of Sedimentation and Stratigraphy.* ★3 (Second Term, 3-0-3). Sedimentary processes, environments and facies; properties and classification of sedimentary rocks; stratigraphic nomenclature and the stratigraphic column; principles of stratigraphic paleontology. Prerequisites: GEOL 202 and 203.

GEOL 330. *Mineralogy I.* ★3 (First Term, 3-0-3). Principles of crystallography, physical and chemical properties of minerals, determinative mineralogy. Prerequisites: GEOL 202, CHEM 200 or 202, MATH 204.

GEOL 331. *Mineralogy II.* ★3 (Second Term, 3-0-3). Optical techniques in determinative mineralogy with particular emphasis on transmitted-light microscopy and its application to common rock-forming minerals. Prerequisites: GEOL 330, PHYS 207 or 240.

GEOL 362. *Principles of Geologic Mapping.* ★3 (Second Term, 3-0-3). A laboratory course involving the construction and analysis of geologic maps and cross-sections, and hand-specimen petrology. Prerequisite: GEOL 330.

GEOL 380. *Geomorphology.* ★3 (First Term, 3-0-3). Landforms and the processes which create and modify them. Study of landforms on aerial photographs and topographic maps. Prerequisite: GEOL 202.

GEOL 390. *Engineering Earth Sciences.* ★3 (First Term, 3-0-3). Rock-forming minerals, igneous activity and igneous rocks, metamorphic and sedimentary rocks, economic minerals; rock weathering and soil formation, mass-wasting, groundwater, deformation of the earth's crust. Laboratories on identification of minerals and rocks and the interpretation of geological maps and aerial photography. Not available to students with credit in GEOL 202 or 301.

GEOL 391. *Engineering Geology.* ★3 (Second Term, 3-0-3). Introduction to geological topics important in engineering and regional planning; mass-wasting, hydrogeology, surficial geology, weathering processes and their effects on natural materials. Analysis of aerial photography and maps to determine constraints on land use imposed by geology. Prerequisite: GEOL 202 or 390.

GEOL 401. *Basic Geology for Senior Students.* ★3 (First Term, 3-0-3). The structure and composition of the earth, continents and oceans; minerals and rocks; time-scale, historical geology and an introduction to geotectonics. Not available to students with credit in GEOL 202, 301 or 390, and 203 or 302. Intended for graduate students or students majoring in subjects other than geology.

GEOL 409. *Geology Field School III.* ★2. Ten days geological mapping of highly deformed sedimentary and metamorphic rocks. Prerequisites: GEOL 362 and 460.

†GEOL 412. *Micropaleontology.* ★6 (3-0-3). Principles of micropaleontology, techniques, systematic treatment of Foraminifera. Prerequisite: GEOL 310.

†GEOL 414. *Paleontology.* ★3 (Second Term, 3-0-3). Morphology, paleoecology and evolution, with emphasis on both the theoretical aspects and practical techniques of paleontology. Concentration on invertebrate paleontology, but examples from vertebrate paleontology and paleobotany included. Prerequisite: GEOL 310.

GEOL 420. *Stratigraphy I.* ★3 (First Term, 3-0-3). Historical geology of North America from the Precambrian to the Devonian; Cambrian to Devonian stratigraphic paleontology. Prerequisites: GEOL 310, 320, 362.

GEOL 421. *Stratigraphy II.* ★3 (Second Term, 3-0-3). Historical geology of North America from the Carboniferous to the Cenozoic; Carboniferous to Cenozoic stratigraphic paleontology. Prerequisites: GEOL 310, 320 and 362.

GEOL 430. *Determinative Mineralogy.* ★3 (First Term, 3-0-3). Techniques of mineral investigation including X-ray diffraction and fluorescence, D.T.A., electron microprobe analysis, scanning electron microscopy; mineral separation and preparation; application to selected minerals and mineral groups. Prerequisite: GEOL 331.

GEOL 440. *Hand Specimen Petrography.* ★3 (Second Term, 3-0-3). Study of igneous, sedimentary and metamorphic rocks in hand specimens. Not available to students with credit in GEOL 330, 331, 445, 446 or 447. Prerequisite: GEOL 202 or 390 or 401.

GEOL 445. *Igneous Petrology.* ★3 (First Term, 3-0-3). Classification and genesis of igneous rocks; hand specimen and thin section study. Not available to students with credit in GEOL 440. Prerequisite: GEOL 331.

GEOL 446. *Introductory Sedimentary Petrology.* ★3 (Second Term, 3-0-3). Processes of sedimentation; weathering, transportation, deposition, diagenesis; classification and description of sedimentary rocks. Not available to students with credit in GEOL 440. Prerequisites: GEOL 320, 445.

GEOL 447. *Metamorphic Petrology.* ★3 (Second Term, 3-0-3). Classification and genesis of metamorphic rocks; hand specimen and thin section study. Not available to students with credit in GEOL 440. Prerequisites: GEOL 445, 446.

GEOL 452. *Geochemistry I.* ★3 (Second Term, 3-0-3). A survey of chemical processes taking place in geologic settings with emphasis on the abundance relationships of the elements in the earth's crust and the laws governing the migration and distribution of the elements of the earth. Prerequisites: CHEM 200 or 202, GEOL 445. Corequisite: GEOL 446.

GEOL 459. *Geochemical Prospecting.* ★3 (First Term, 3-0-3). Application of geochemistry to the search for mineral deposits. Prerequisite: GEOL 452.

GEOL 460. *Structural Geology I.* ★3 (First Term, 3-0-3). Nature, orientation, measurement, representation and analysis of planar and linear structures, faults, joints and folds. Prerequisites: GEOL 362, PHYS 240 or PHYS 205 and 207.

GEOL 475. *General Geotectonics.* ★3 (Second Term, 3-0-0). A general course on the nature, architecture and origin of the crust of the earth, the structure and general history of continents and oceans; geochronology; paleomagnetism and polar wandering, ocean floor spreading, plate tectonics and continental drift. Geology 475 is primarily for senior or graduate students with little or no geological background and is intended to be taken in conjunction with Physics 421. Prerequisite: PHYS 421.

GEOL 482. *Glacial and Periglacial Geology.* ★3 (First Term, 3-0-3). Elements of glaciology; character and origin of glacial deposits and landforms; geological processes, sediments and landforms in the periglacial environment; frozen ground phenomena, including permafrost; glacio-isotatic rebound and eustatic changes in sea level; glacial history of Western Canada; field trips. Prerequisite: GEOL 380 or consent of the Department.

†GEOL 484. *Quaternary Environments I.* ★3 (First Term, 3-0-0). A comprehensive survey of the Quaternary as a geologic period; relative and absolute dating methods, case studies in stratigraphy and paleoclimatology. Corequisite: GEOL 482 or consent of Department. Note: Registrants in this course are expected to register in ANTHRO 494 for the second term.

GEOL 500. *Tutorial.* ★3 (1½-0-0). Small group instruction with an individual staff member in a subject of specializaiton of the student's choice. Essays, reading and practical studies may be set. Open only to students enrolled in the fourth year of an Honors or Specialization program.

GEOL 507. *Research Project I.* ★3 (either term).

GEOL 508. *Research Project II.* ★3 (Second Term). Geology 507 and 508 provide a means whereby students enrolled in the fourth year of an Honors or Specialization Program may undertake a research project supervised by a faculty member equivalent to one or two single-term courses.

GEOL 509. *Geology Field School IV.* ★1. A ten-day excursion through the Canadian Cordillera to examine the regional geology with special emphasis on igneous and metamorphic rocks. Prerequisites: GEOL 409, 445, 447.

GEOL 523. *Subsurface Geologic Methods.* ★3 (Second Term 3-0-3). Methods of acquiring geologic data from beneath the surface by remote means: drilling, sampling, coring, logging; significance of geophysical techniques; presentation of subsurface information. Prerequisite: GEOL 320 and 362.

GEOL 524. *Petroleum Geology I.* ★3 (First Term, 3-0-3). Origin and accumulation of petroleum hydrocarbons; stratigraphic and geographic distribution of oil and gas deposits; petroleum exploration; case histories. Prerequisites: GEOL 362, 420 or 421.

GEOL 525. *Petroleum Geology II.* ★3 (Second Term, 3-0-0). Characteristics of classic oil and gas provinces and fields; geologic analysis of sedimentary basins; economics of petroleum; case histories. Prerequisite: GEOL 524.

GEOL 526. *Coal and Industrial Minerals.* ★3 (First Term, 3-0-3). Composition and origin of coal; diagenesis and metamorphism; macrolithotypes and macerals; coal analysis, classification and uses; coal resources and reserves; occurrence, origin and use of non-metalliferous industrial rocks and minerals. Prerequisites: GEOL 446 and 460.

†GEOL 528. *Precambrian Geology.* ★3 (First Term, 0-3s-0). Precambrian geologic record with special reference to the stratigraphy, structure, petrology, mineral deposits, geochronology and metamorphism of the Canadian Shield and Western Canadian Cordillera. Prerequisites or corequisite: GEOL 420, 447.

†GEOL 530. *Rock-Forming Minerals.* ★3 (Second Term, 3-0-3). Structure, composition, optical and physical properties, phase relationships and paragenesis of important rock-forming minerals and mineral groups. Prerequisite: GEOL 430.

GEOL 532. *Metalliferous Mineral Deposits.* ★3 (First Term, 3-0-3). An introduction to the geologic characteristics and distribution of the principal metalliferous mineral deposits. Prerequisites: GEOL 445, 446, 460. Corequisite: GEOL 447.

GEOL 533. *Ore Petrology.* ★3 (Second Term, 3-0-3). Mineralogy and petrogenesis of metalliferous deposits; mechanism of hydrothermal transport and deposition; metamorphic and igneous processes of ore segregation and modification; application of isotope data to the study of ores. Prerequisite: GEOL 532.

GEOL 534. *Geology of Nuclear Fuel Resources.* ★3 (Second Term, 0-0-0). Geology and genesis of uranium and thorium deposits in sedimentary, igneous and metamorphic environments; uranium and thorium geochemistry and mineralogy; nuclear power and nuclear resource economics in the future; geochemical methods in nuclear resource exploration; distribution of nuclear resources in time and space. Prerequisite: GEOL 532.

GEOL 546. *Sedimentary Petrology.* ★3 (First Term, 3-0-3). Processes of clastic and chemical sedimentation, and diagenesis; sedimentary environments and facies; laboratory techniques in the study of sedimentary rocks. Prerequisite: GEOL 446.

GEOL 547. *Petrogenesis of Igneous and Metamorphic Rocks.* ★3 (Second Term, 3-0-3). Origin and formation of igneous and metamorphic rocks in the light of field, mineralogical, chemical and experimental evidence. Prerequisites or corequisite: GEOL 445, 447, 452.

GEOL 553. *Geochemistry II.* ★3 (Second Term, 3-0-3). Physiochemical principles and thermodynamics developed in a geological context, theoretical phase equilibria in sedimentary, metamorphic and igneous rock systems. Prerequisite: GEOL 452.

†GEOL 563. *Structural Geology II.* ★3 (Second Term, 3-0-3). Numerical geometric analysis; analysis of strain; structural associations. Prerequisite: GEOL 460.

GEOL 570. *Geotectonics.* ★3 (Second Term, 3-0-0). Composition and nature of the earth's crust and mantle; ocean basins, ridges and trenches; continental shield areas and orogenic belts; the general theory of plate tectonics and its application to crusted processes. Prerequisites or corequisites: GEOL 447, 460.

†GEOL 580. *Geostatistics I.* ★3 (Second Term, 3-0-3). An introduction to the philosophy and rudimentary aspects of the application of basic quantitative methods to the analysis of geological data. Prerequisites: GEOL 380, GEOL 420 or 421, GEOL 445 and 446.

†GEOL 581. *Geostatistics II.* ★3 (Second Term, 3-0-3). Application of multivariate quantitative methods to the analysis of geological problems. Prerequisite: GEOL 580.

†GEOL 582. *Selected Topics in Glacial Geology.* ★3 (First Term, 0-3s-0). Prerequisite: GEOL 482.

GEOL 588. *Hydrogeology.* ★3 (First Term, 3-0-3). Occurrence, distribution, movement and chemistry of groundwater as a function of the geological environment; groundwater as a geologic agent; methods of collection, organization and use of hydrogeologic data; groundwater budgets, model studies, selected problems and case histories. Prerequisites: GEOL 380, MATH 204.

GEOL 592. *Photogeology and Remote Sensing.* ★3 (First Term, 3-0-3). Application of aerial photographs to geological mapping and terrain analysis; interpretation of geological structure and landforms; remote sensing in geology; sensor principles and capabilities; analysis of imagery. Prerequisite: Consent of the Department.

GEOL 601. *Environmental Geology.* ★3 (Second Term, 3-0-0). Geology for land use planning.

GEOL 607. *Geologic Research.* ★3 (either term, 0-0-8).

†GEOL 612. *Advanced Micropaleontology.* ★3 (either term, 4-2s-0).

†GEOL 616. *Palynology.* ★3 (either term, 3-3s-0).

†GEOL 622. *Advanced Stratigraphy.* ★6 (3-0-3).

GEOL 624. *Advanced Sedimentology.* ★6 (0-3s-0). Seminars given by instructor and students; emphasis will be on the interpretation of ancient sedimentary environments; normally the concentration will be on detrital sedimentation in the first term and on chemical sedimentation in the second.

GEOL 626. *Fossil Energy Resources.* ★3 (either term, 0-3s-0).

GEOL 628. *Geology of Oil Sand Deposits.* ★3 (First Term, 3-3-0). Basic introduction to stratigraphy and sedimentation of Alberta Oil Sands deposits, with emphasis on sedimentary processes, facies analysis and environments of deposition. Introduction to basic petroleum geology, with emphasis on detailed geology of Alberta heavy oil deposits. Labs will include regional log correlations, core descriptions, sedimentary facies interpretations and analysis of tar sands. Prerequisite: Consent of the Department.

GEOL 631. *Mineralogy Seminar.* ★3 (either term, 0-3s-0).

GEOL 632. *Advanced Ore Petrogenesis.* ★3 (Second Term, 0-3s-0). Selected topics in modern concepts of ore genesis.

GEOL 633. *Economic Geology.* ★3 (Second Term, 3-0-0). The economics of exploration and exploitation with respect to metalliferous raw materials. Exploration logistics and planning. Property evaluation. Drilling and sampling techniques. Reserve and grade estimation.

GEOL 639. *Theory and Practice of Microbeam Analysis.* ★3 (First Term, 3-0-3). Instrumentation, theory and applications in the Earth Sciences, with particular reference to electron microprobe analysis.

GEOL 640. *Chemical Petrology.* ★3 (Second Term, 2-2s-0).

GEOL 644. *Selected Topics in Petrology.* ★3 (either term, 0-3s-0).

†GEOL 646. *Advanced Sedimentary Petrography.* ★3 (First Term, 1-0-3).

†GEOL 647. *Advanced Metamorphic Petrology.* ★3 (either term, 0-3s-0).

†GEOL 650. *Advanced Geochemistry.* ★3 (Second Term, 0-3s-0).

†GEOL 654. *Isotope Geology; Radioactive Systems.* ★3 (First Term, 3-0-0).

†GEOL 655. *Isotope Geology: Stable Isotope Fractionation.* ★3 (Second Term, 3-0-0).

†GEOL 660. *Advanced Structural Geology.* ★3 (First Term, 3-0-0).

†GEOL 661. *Regional Structural Geology.* ★3 (First Term, 3-0-3).

†GEOL 680. *Quantitative Geomorphology.* ★3 (Second Term, 3-0-3).

GEOL 681. *Selected Topics in Geostatistics.* ★3 (either term, 0-3s-0).

†GEOL 683. *Selected Topics in Quaternary Geology.* ★3 (First Term, 0-3s-0). Prerequisite: GEOL 482.

GEOL 684. *Deposits in Permafrost Regions.* ★3 (Second Term, 0-3s-0). Analysis and applied aspects of surficial deposits in permafrost regions.

GEOL 686. *Quantitative Hydrogeology.* ★3 (First Term, 0-3s-0).

GEOL 687. *Selected Topics in Hydrogeology.* ★3 (Second Term, 0-3s-0).

184.14 Geophysics

Department of Physics

The following courses in geophysics are offered by the Department of Physics: See § 183.17 for details of programs offered.

GEOPH 327. *Seismic Exploration Methods.* ★3 (First Term, 3-0-3/2). Elastic properties of rocks. Geometric rays. Application of seismic refraction and reflection methods. Interpretation of seismic sections. Sonic logging. Prerquisites: MATH 204; PHYS 205 and 209. Note: Credit is not available to students majoring in Physics or Geophysics.

GEOPH 329. *Geophysical Prospecting.* ★3 (Second Term, 3-0-3). Application and interpretation of gravitational, magnetic and electromagnetic prospecting methods. Theory of well logging. Geothermal properties of the earth. Heat. Prerequisites: MATH 204; PHYS 205 and 209. Note: Credit is not available to students majoring in Physics or Geophysics.

GEOPH 421. *Physics of the Earth.* ★3 (First Term, 3-0-0). The solar system, its origin and the abundance of elements. Meteorites. Elements of seismology, properties of the earth's interior. Gravity and the shape of the earth. Heat flow and thermal history of the earth. Geomagnetism, aeronomy, magnetosphere and interplanetary space. GEOL 475 is intended as a suitable single-term course complement. Prerequisite: PHYS 340 or 382.

GEOPH 425. *Gravity, Magnetic and Electrical Prospecting Techniques.* ★3 (First Term, 3-0-0). Elementary potential theory as required for gravity, magnetic and electrical studies of the earth's crust. Gravimeters and magnetometers; magnetic and electrical properties of rocks; well logging methods; induced polarization. Prerequisite: PHYS 340 or 382.

GEOPH 427. *Ray Seismology.* ★3 (Second Term, 3-0-0). Use of seismic refraction and reflection methods for exploration of petroleum and ground water. Elasticity theory, seismic instrumentation, velocity surveys, near surface corrections. Prerequisite: PHYS 340 or 382.

GEOPH 521. *Seismology and Physical Structure of the Earth.* ★3 (Second Term, 3-0-0). Seismology; Infinitessimal strain theory; elastic stress and modulii of elasticity; plane waves in isotropic layered media; imperfectly elastic media; earthquake mechanisms. Physical structure of the earth; seismometers; geochronology and isotope studies. Prerequisite: MATH 402 or 437.

GEOPH 523. *Geomagnetism, Potential Theory and Tectonophysics.* ★3 (First Term, 3-0-0). Potential theory and the earth's gravitational field; gravimeters and magnetometers; geomagnetisms, rock magnetism and paleomagnetism; electromagnetic induction studies; heat flow; orogenesis, tectonophysics; the magnetosphere. Prerequisite: MATH 402 or 437.

GEOPH 525. *Electromagnetic and Potential Methods of Exploration.* ★3 (First Term, 3-0-0). Theory and application of Maxwell's equations. Potential theory as applied to gravity, magnetic and electrical studies. Interpretation of field data. Direct and indirect methods of inversion to obtain model structures. Prerequisite: GEOPH 425 or equivalent. Corequisite: GEOPH 528.

GEOPH 527. *Time Series in Applied Seismology.* ★3 (First Term, 3-0-0). Application of time series analyses to seismic data processing. Fast Fourier transforms; Z transformation, spectral analyses, band pass and velocity filtering, deconvolution, auto and cross correlation; analog to digital conversion, wave propagation in layered media. Prerequisite: GEOPH 427 or equivalent. Corequisite: GEOPH 528.

GEOPH 528. *Applied Geophysics Field School and Laboratory* ★5 (2-0-3). Ten day field camp before the beginning of the fal term. The field data will be analyzed during the fall and winte terms. Topics included are method in exploration geophysics relection and refraction seismology; gravity and magneti interpretation; electromagnetic and electrical methods o studying the earth. Prerequisite: MATH 402 or equivalent.

184.15 Interdisciplinary Studies

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). An examination of current environmental research in the Canadia North. Seminars are presented by professionals engaged i various facets of northern research. Prerequisite: Consent c the Department. (Offered by the Boreal Institute for Norther Studies and the Department of Geography.)

184.16 Laboratory Animal Management

Department of Microbiology

LB AN 301. *Laboratory Animal Biology.* ★3 (Second Term 3-0-3). An introductory course on the care, maintenance an use of some common laboratory animals.

LB AN 500. *Animal Models for Research.* ★3 (First Term, 2-0-3 Principles and concepts in the selection and utilization of an mal models for research. Special reference will be given t procedures of pre- and post-operative animal care, and min surgery techniques. Laboratory project sessions. Enrollme limited to ten students.

184.17 Linguistics

LING 303. *Introduction to Linguistics.* ★3 (either term, 3-2s-0 Methods for the analysis of language; phonetics, phonolo (sound structure), morphology (word formation), synt

(sentence structure). This course is a prerequisite for most other courses in the department.

LING 304. *Experimental Linguistics.* ★3 (Second Term, 3-0-3). Issues and methods involved in the experimental study of language functions; a survey of studies in experimental phonology, syntax, and semantics. Prerequisite: LING 303.

LING 307. *Acoustic Phonetics.* ★3 (First Term, 3-0-3). Acoustics of speech sounds. Survey of articulatory features of various languages. Lab: instrumental methods for observing and measuring the acoustic features of speech.

LING 308. *Physiological Phonetics.* ★3 (Second Term, 3-0-3). Anatomy and physiology of speech production and hearing. Lab: instrumental techniques for observing and measuring the activity of the speech mechanism.

LING 407. *Formal Analysis of Language I.* ★3 (First Term, 3-0-0). Principles and methods in the analysis and description of languages; comparison of concepts of the major schools of thought in linguistics with respect to phonological and grammatical systems. Prerequisites: LING 303 or consent of the Department.

LING 408. *Formal Analysis of Language II.* ★3 (Second Term, 3-0-0). Analysis of concepts common to all languages, and of the notions of grammar, theory, and model of language; exemplification through analyses of languages disparate in structural form. Prerequisite: LING 303 or consent of the Department.

LING 409. *Syntactic Theory.* ★3 (First Term, 3-0-0). Formal properties of the generative syntactic model; the base component, transformational rules. Prerequisite: LING 303 or consent of the Department.

LING 410. *Phonological Theory.* ★3 (Second Term, 3-0-0). Distinctive feature analysis; morpheme structure rules; phonological rules. Prerequisite: LING 409.

LING 416. *Language Acquisition.* ★3 (either term, 3-0-0). Basic issues in language acquisition; processes, stages, structural and functional contributions, universal semantic distinctions, error analysis. Prerequisite: LING 303.

LING 420. *Topics in Experimental Linguistics.* ★3 (either term, 0-3s-0). Evaluation of current research from language acquisition, pathology, and normal language functions. Prerequisite: LING 304 or consent of the department.

LING 511. *Honors Seminar I.* ★3 (First Term, 0-3s-0). Reports by students on Honors thesis research projects. Note: Required of all final year Honors students in Linguistics.

LING 512. *Honors Seminar II.* ★3 (Second Term, 0-3s-0). Reports by students on Honors thesis research projects. Note: Required of all final year Honors students in Linguistics.

LING 521. *Psycholinguistics.* ★3 (First Term, 3-0-0). A survey of current theories and research in the field of psycholinguistics. Prerequisite: Consent of the Department.

LING 522. *Speech Production and Perception.* ★3 (Second Term, 3-0-0). A survey of the present state of knowledge in speech production and perception. Prerequisite: Consent of the Department.

LING 541. *Quantitative Methods in Linguistics.* ★3 (either term, 3-0-0). Analysis of variance and experimental design in relation to problems in experimental linguistics. Prerequisite: A course in elementary statistics or consent of the Department.

LING 551. *Seminar in Phonological Theory.* ★3 (First Term, 0-3s-0). The structure of the phonological component; critical analysis of current issues in phonological theory. Prerequisite: Consent of the Department.

LING 552. *Seminar in Syntactic Theory.* ★3 (Second Term, 0-3s-0). Critical examination of current issues in syntactic and semantic theory; case grammar, generative semantics, interpretive semantics. Prerequisite: LING 551 or consent of the Department.

LING 565. *Instrumentation in Experimental Linguistics I.* ★3 (either term, 3-0-0). Prerequisites: LING 307/308, MATH 207/208 or consent of the Department.

LING 583. *Experimental Methods in Linguistics I.* ★3 (First Term, 0-1s-3). Discussion and replication of selected experiments in psycholinguistics, and in speech production and perception. Prerequisite: LING 521/522.

LING 584. *Experimental Methods in Linguistics II.* ★3 (Second Term, 0-1s-3). Continuation of topics introduced in Linguistics 583. Prerequisite: LING 583.

LING 599. *Special Problems.* ★3 (First Term, 0-3s-0). Designed to meet the needs of individual M.Sc. students.

LING 605. *Foundations of Linguistic Theory.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

LING 621. *Seminar in Linguistic Analysis of Aphasic Language.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

INT D 623. *Clinical Research Seminar on Aphasia.* ★3 (either term, 3-0-3).

LING 633. *Seminar in Language Acquisition.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

LING 635. *Advanced Topics in Psycholinguistics.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

LING 636. *Seminar in the Analysis of Meaning.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

LING 641. *Advanced Quantitative Methods in Linguistics.* ★3 (either term 3-0-0). Prerequisite: LING 541 or its equivalent.

LING 651. *Departmental Research Seminar I.* ★3 (First Term, 0-3s-0). Prerequisite: Consent of the Department.

LING 652. *Departmental Research Seminar II.* ★3 (Second Term, 0-3s-0). Prerequisite: LING 651.

LING 666. *Instrumentation in Experimental Linguistics II.* ★3 (Second Term, 3-0-0). Prerequisite: LING 665 or consent of the Department.

LING 667. *Articulation Control Mechanisms.* ★3 (either term, 3-0-0). Prerequisites: LING 665/666 or consent of the Department.

LING 669. *Speech Perception Mechanisms.* ★3 (either term, 3-0-0). Prerequisites: LING 665/666 or consent of the Department.

LING 683. *Conference Course I.* ★3 (First Term, 0-3s-0).

LING 684. *Conference Course II.* ★3 (Second Term, 0-3s-0).

184.18 Marine Science

Staff, Marine Station at Bamfield, B.C.
(Spring and Summer Sessions only)

MA SC 400. *Directed Studies.* ★6 (0-6L-0). A course of directed studies under the supervision of a visiting professor. The study will involve a research project approved by the supervisor in the field of interest of the student, and will be designed to take maximum advantage of the laboratory and/or field opportunities offered by the Bamfield Marine Station.

MA SC 401. *Special Topics in Marine Biology.* ★6 (0-6L-0). Offered, as opportunities arise, by distinguished scientists who are working at the Bamfield Marine Station. It is expected that the course will generally be of a specialized nature and be at a level appropriate to graduate or senior undergraduate students.

MA SC 402. *Special Topics in Marine Biology.* ★3 (0-3L-0). Offered, as opportunities arise, by distinguished scientists who are working at the Bamfield Marine Station and are prepared to offer a course extending over a 3-week period. Course will be of a specialized nature.

MA SC 410. *Marine Invertebrate Zoology.* ★6 (0-6L-0). A survey of the marine phyla, with emphasis on the benthic fauna in the vicinity of the Bamfield Marine Station. The course includes lectures, laboratory periods, field collection, identification, and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.

MA SC 411. *Comparative Invertebrate Embryology.* ★6 (0-6L-0). A comprehensive study of the development of marine invertebrates available at the Bamfield Marine Station, including all major phyla and most of the minor phyla. A total of 25 to 30 lectures, covering gametogenesis, fertilization, larval development and metamorphosis of different groups will be given. Laboratory work will include methods and techniques of obtaining and handling of gametes, preparation and maintenance of larval cultures, and observations of development up to metamorphosis if possible. Some selected and clearly defined experiments will be performed. Efforts will be made also to study various pelagic larvae collected from the plankton.

MA SC 412. *Biology of Fishes.* ★6 (0-6L-0). Classification, physiology, ecology, behavior and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Course will involve some field projects.

MA SC 420. *Marine Phycology.* ★6 (0-6L-0). A survey of the marine algae, with emphasis on the benthic forms in the vicinity of

the Bamfield Marine Station. The course includes lectures, laboratory periods, field collection, identification, and observation. Emphasis is placed on the study of living specimens in the laboratory and in the field.

MA SC 430. *Marine Ecology.* ★6 (0-6L-0). An analytical approach to biotic associations in the marine environment. Opportunities will be provided for study of the intertidal realm in exposed and protected areas and of beaches and estuaries in the vicinity of the Bamfield Marine Station; plankton studies and investigations of the subtidal and benthic environments by diving and dredging are envisaged.

MA SC 435. *Introduction to Biological Oceanography.* ★6 (0-6L-0). An introduction to the biology of the oceans, with supporting coverage of relevant physics and chemistry. Emphasis on plankton biology, community structure and life histories, and influencing environmental factors. Collections will be made from sheltered inlets, through Barkley Sound to offshore waters. Course will involve both field and laboratory studies of plankton organisms.

184.19 Mathematical Physics

Departments of Mathematics and Physics

MA PH 443. *Classical Mechanics I.* ★3 (First Term, 3-0-0). Review of fundamental principles; Lagrange's equations derived from Newton's Laws and D'Alembert's Principle; non-conservative and non-holonomic systems; central force problem; motion of a rigid body. Prerequisites: PHYS 343 or MATH 309; MATH 303 or 308.

MA PH 444. *Classical Mechanics II.* ★3 (Second Term, 3-0-0). Variational principles; Hamilton's equations; canonical transformations; Hamilton-Jacobi equation; principles of fluid mechanics. Prerequisite: MA PH 443 or consent of both departments.

MA PH 467. *Mechanics of Deformable Media.* ★3 (Second Term, 3-0-0). Stress and strain in continuous media; elasticity; mechanics of fluid flow in 2 dimensions using complex variables; 3 dimensional fluid flow using Eulerian and Lagrangian reference frames; thermodynamics and mechanics of compressible and viscous flows; onset of turbulence, convection and instability. Examples from geophysics, oceonography and atmospheric physics. Prerequisites: PHYS 311, MATH 431, MA PH 443, MATH 405, or 408 or consent of both departments.

MA PH 551. *Mathematical Methods of Physics I.* ★3 (First Term, 3-0-0). Application to problems in physics of: method of steepest descent; Fourier and Laplace transforms; boundary-value problems, integral equations and Green's functions. Prerequisites: PHYS 471 and 482, or consent of both departments.

MA PH 553. *Mathematical Methods of Physics II.* ★3 (Second Term, 3-0-0). Application to problems in physics of: contour integral solutions of linear differential equations; Legendre, Bessel and hypergeometric functions with complex arguments; applications to the differential and integral equations of mathematical physics; perturbation theory; calculus of variations; conformal mapping; elements of group theory. Prerequisite: MA PH 551 or consent of both departments.

MA PH 568. *Introduction to Relativity.* ★3 (Second Term, 3-0-0). Special Relativity, principle of equivalence, Einstein field equations, stationary and static fields, Schwarzschild metric, experimental tests, black holes, linearized equations, gravitational collapse, cosmology. Prerequisite: MATH 466 or equivalent.

MA PH 669. *General Relativity.* ★6 (3-0-0). Algebraic analysis of the field equations, Cauchy initial value problem, gravitational radiation, algebraically special fields, conservation laws, gravitational collapse and black holes. Relativistic astrophysics, cosmological models, global structure of space-time. Prerequisite: MATH 466 or consent of both departments.

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MATH 100. *Elements of Algebra.* ★6 (3-0-0). The topics of Mathematics 30. Prerequisite: MATH 20 of high school, or equivalent.

MATH 101. *Trigonometry.* ★3 (First Term, 2-0-0). This course consists of the Trigonometry material contained in Mathematics 100 and is offered in the Winter Session. Prerequisite: MATH 20 or equivalent. Note: this course cannot be taken for credit towards a degree.

MATH 202. *Elementary Calculus I.* ★3 (First Term, 3-0-1). Review of analytic geometry, differentiation and integration of simple functions, applications. Prerequisite: Mathematics 30 or equivalent. Note: Those students who have no knowledge of trigonometry are required to take MATH 101 concurrently. This course may not be taken if credit has already been obtained in any of MATH 203, 207, 212, or 245.

MATH 203. *Elementary Calculus I.* ★3 (either term, 3-0-0). This course description is the same as for MATH 202. Prerequisite: Mathematics 30, Mathematics 31 (calculus sequence), or equivalent. Students with low grades in high school calculus should take MATH 202. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 202, 207, 212, 245.

MATH 204. *Elementary Calculus II.* ★3 (either term, 3-0-0). Differentiation and integration of trigonometric, exponential and logarithmic functions. Indeterminate forms and improper integrals. Techniques of integration. Application. Prerequisite: MATH 202 or 203, or 245 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 208 or 213.

MATH 207. *Honors Calculus I.* ★3 (First Term, 4-0-0). Functions, continuity and the derivative. Applications of the derivative. Integration and the Fundamental Theorem. Prerequisite: Mathematics 30, Mathematics 31 or their equivalents. Note: This course is designed for students with at least a 75 per cent grade in Mathematics 30. Other students may be admitted with the consent of the Department. This course may not be taken for credit if credit has already been obtained in any of MATH 202, 203, 212, or 245.

MATH 208. *Honors Calculus II.* ★3 (Second Term, 4-0-0). Techniques and applications of integration. Derivatives and integrals of the exponential, and trigonometric functions. Extended limits and l'Hospital's rule. Introduction to infinite series. Introduction to partial derivatives. Elementary differential equations of first and second order. Prerequisite: MATH 207 or its equivalent. Students with MATH 202 or 203 will be admitted with the consent of the Department. Note: This course may not be taken for credit if credit has already been obtained in MATH 204 or 213.

MATH 221. *Linear Algebra I.* ★3 (either term, 3-0-0). Solving linear equations, matrix algebra, determinants, n-space, linear programming. Prerequisite: Mathematics 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 243, 274, 278, 281 or 312.

MATH 222. *Linear Algebra II.* ★3 (either term, 3-0-0). Bases, linear transformations, change of bases, eigenvectors. Markov processes. Prerequisites: MATH 221 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 378 or MATH 381.

MATH 240. *Algebra and Elementary Calculus I.* ★3 (either term, 4-0-0). Differential and integral calculus of algebraic, exponential and logarithmic functions with applications to problems in Business and Economics. Prerequisite: Mathematics 30 or equivalent. Note: This course is intended primarily for students registered in the Faculties of Business Administration and Commerce, Agriculture and Forestry, and Pharmacy and Pharmaceutical Sciences. This course may not be taken for credit if credit has already been received in any of MATH 202, 203, 207 or 212. Students who have taken Mathematics 31 should take MATH 242. Note: This course is *not* available for credit to students registered in the Faculty of Science.

MATH 242. *Algebra and Elementary Calculus I.* ★3 (either term, 3-0-0). This course covers the same material as MATH 240. Prerequisite: Mathematics 30 and Mathematics 31 or equivalent.

MATH 243. *Linear Algebra.* ★3 (either term, 3-0-0). Vector and matrix notation, solving linear equations, vector spaces, matrix algebra, determinants, and applications to economics and commerce, including linear programming, marketing problems, and input-output analysis. Prerequisite: Mathematics 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of the following: MATH 274, 278, 312, 381. This course is required for all students in Business Administration and Commerce.

MATH 245. *Elementary Calculus II.* ★3 (Second Term, 3-0-0). Properties and calculus of trigonometric functions, implicit differentiation, partial differentiation, integral tables. Prerequisite: MATH 240 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 202, 203, 207 or 212.

MATH 251. *Mathematics of Finance I.* ★3 (First Term, 3-0-0). Simple and compound interest, force of interest; applications. Certain annuities, simple and general. Perpetuities. Prerequisite: Mathematics 30.

MATH 252. *Mathematics of Finance II.* ★3 (Second Term, 3-0-0). Applications of interest: amortizations, sinking funds, depreciation, depletion, bonds and stocks. Investments. Cash flow analysis. Income tax considerations. Prerequisite: MATH 251.

MATH 261. *Foundations of Mathematics I.* ★3 (either term, 3-0-0). Axiomatic treatment of mathematical systems. Groups, rings and fields. Elementary logic and methods of proof. Prerequisite: MATH 30. Note: This course is primarily for students of Elementary Education who have not chosen mathematics as an area of concentration. It may not be taken for credit by Arts and Science students.

MATH 262. *Foundations of Mathematics II.* ★3 (either term, 3-0-0). Introduction to set theory. Cartesian products, relations and functions. Applications to elementary algebra, combinatorics, and topology. Classical and modern views of geometry with applications. Prerequisite: MATH 261.

MATH 281. *Honors Algebra I.* ★3 (First Term, 3-0-0). Vectors, planes and lines, linear transformations and matrices; systems of linear equations, vector spaces and sub-spaces, dimensions; determinants. Prerequisite: Mathematics 30 and 31 or equivalent. Note: This course is recommended for students with at least a 75% grade in Mathematics 30. Other students may be admitted with the consent of the Department. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 243, 278, 312.

MATH 282. *Honors Algebra II.* ★3 (Second Term, 3-0-0). Relations, equivalence relations; groups, Lagrange's theorem; rings, fields, polynomials, finite fields. elementary error-detecting and error-correcting codes. Prerequisite: MATH 281. Note: This course may not be taken for credit if credit has already been obtained in MATH 279 or MATH 328.

MATH 302. *Intermediate Calculus I.* ★3 (either term, 3-0-0). Vectors in space geometry, determinants, Cramer's rule, complex numbers, partial differentiation, multiple integration. Prerequisite: MATH 204 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 307 or 315.

MATH 303. *Intermediate Calculus II.* ★3 (either term, 3-0-0). Infinite series, elements of linear differential equations, curves and tangent vectors, polar cylindrical and spherical coordinates, arc length and surface area. Prerequisite: MATH 302 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 308 or 315.

MATH 307. *Honors Advanced Calculus I.* ★3 (First Term, 4-0-0). Axiomatic development of the real number system. Topology of R^n. Sequences, limits and continuity. Multiple integration. Differential calculus; the chain rule. Prerequisite: MATH 208 or consent of the Department. Corequisite: MATH 281. Note: This course is required for second year Honour students in Mathematics and Physics. Other students admitted only with the consent of the Department. This course may not be taken for credit if credit has already been obtained in either of MATH 302, 315.

MATH 308. *Honors Advanced Calculus II.* ★3 (Second Term, 4-0-0). Differential calculus, Taylor's formula, maxima and minima. Transformations of multiple integrals. Line integrals theorems of Green, Gauss and Stokes. Sequences and Series. Uniform convergence. Improper integrals. Prerequisite: MATH 307. This course may not be taken for credit if credit has already been obtained in MATH 303.

MATH 309. *Mechanics.* ★6 (3-0-0). Foundations. Statics and the principle of virtual work. Kinematics. Plane motion of a particle and a rigid body. Conservation laws. Harmonic oscillator. Motion in a central field. Impulsive motion. Prerequisite: PHYS 240 or equivalent. Prerequisite or corequisite: MATH 308. Note: This course is primarily intended for Honors students in Mathematics. Other students admitted only with the consent of the Department.

MATH 310. *Elementary Mechanics.* ★6 (3-0-0). Newton's Laws. Plane statics. Systems of forces. Centre of mass. Friction. Principle of virtual work. Thin beams. Plane kinematics and dynamics of a particle. Projectile motion. Circular motion and simple harmonic motion. The conservation laws. Stability of equilibrium. Plane motion of a rigid body. Impulsive motion. Prerequisite: MATH 204 or equivalent. Corequistes: MATH 302/303 or equivalent.

MATH 317. *Differential Equations I.* ★2 (First Term, 2-0-1). First order linear and non-linear differential equations. Integrating factors. The general linear equation, Wronskians independence. Equations with constant coefficients. Variation of parameters, undetermined coefficients. Prerequisite: MATH 213 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 313. For Engineers only.

MATH 318. *Differential Equations II.* ★2 (Second Term, 2-0-1). Power series solutions. Laplace transforms, inverse transforms and applications. Prerequisite: MATH 317 or equivalent.

MATH 321. *Linear Algebra III.* ★3 (either term, 3-0-0). Diagonalization and triangulization of matrices, Jordan canonical form, application to differential equations, spectral theorem, quadratic forms, orthogonal operators. Prerequisites: MATH 222, 378 or equivalent. A one term calculus prerequisite is recommended. Note: This course may not be taken for credit if credit has already been obtained in MATH 382.

MATH 328. *Introduction to Abstract Algebra.* ★3 (either term, 3-0-0). Properties of the integers, permutations, groups, Lagrange's theorem, factor groups, polynomials, rings, fields. Prerequisite: Mathematics 30 and a previous university level mathematics course. Note: This course may *not* be taken for credit if credit has already been obtained in MATH 279 or MATH 282.

MATH 331. *Introductory Mathematical Modelling I.* ★3 (First Term, 3-0-0). This course is intended to show how mathematics can be used to analyze problems arising in various disciplines. Examples may be taken from such areas as the Natural, Social, and Life Sciences, Economics, Engineering, and Management Science. Their choice will be at the option of the instructor in consultation with the students. Only a modest mathematical background is required. The Department of Mathematics can supply details about the content of the course for the coming academic year. Prerequisite: MATH 204 or equivalent. Prerequisite or corequisite: MATH 221 or equivalent. Note: Honors mathematics students may be expected to read and report on subject matter additional to that discussed in lectures.

MATH 332. *Introductory Mathematical Modelling II.* ★3 (Second Term, 3-0-0). This course is a continuation of Mathematics 331. Problems studied will be of a more advanced nature than those considered in part I. Prerequisite: MATH 331. Prerequisite or corequisite: MATH 303 or equivalent. Other students admitted with the consent of the Department.

MATH 341. *Theory of Interest.* ★3 (First Term, 3-0-0). Accumulation and amount functions. Effective, simple, compound rates. Force of interest. Discount. Annuities certain, simple and general. Perpetuities. Amortization schedules and sinking funds. Bonds and other securities. Applications — valuation of securities, installment loans, depreciation, depletion, capitalized cost. Prerequisites: MATH 204 or equivalent. Note: This course is not open to Science students who have credit in MATH 251.

MATH 342. *Numerical Methods.* ★3 (Second Term, 3-0-0). Calculus of finite differences, difference equations. Polynomial interpolation. Numerical integration. Iterative solution of linear and non-linear systems. Asymptotic evaluation of integrals. Prerequisites: MATH 302 or equivalent, MATH 221 or 243 or 278 or equivalent. Note: Successful completion of the course should prepare the student for the corresponding actuarial examination. Although the course will be numerical in content, proficiency with electronic computers will not be assumed.

MATH 351. *Life Annuities and Life Insurance I.* ★3 (First Term, 3-0-0). Compound interest review. Elements of probability and application to life contingencies. Construction of the mortality table. Types of life annuities and life insurance. Net premiums. Prerequisites: A statistics course, MATH 204 and MATH 341.

MATH 352. *Life Annuities and Life Insurance II.* ★3 (Second Term, 3-0-0). Net and gross premiums. Reserves, net level and modified. Options, surrender values. Distribution of surplus. Group insurance. Pension plans. Prerequisite: MATH 351.

MATH 360. *Geometry.* ★6 (3-0-0). Various concepts of space (Euclidean, affine, projective, and non-Euclidean), axiomatic treatment and models, relation to group theory. An introduc-

tion to point set topology (open and closed sets, Hausdorff and metric spaces). Prerequisites or corequisites: MATH 302/303 or 307/308 or consent of the Department.

MATH 361. *The Nature of Mathematics I.* ★3 (First Term, 3-0-0). Topics from the history, methodology, achievements, and goals of mathematics with illustration from elementary geometry, topology, number theory, algebra, analysis, statistics, probability, and life sciences. Prerequisite: Mathematics 30. Note: This course may not be taken for credit by science students (and is not an option in the Mathematics pattern).

MATH 362. *The Nature of Mathematics II.* ★3 (Second Term, 3-0-0). A continuation of the topics of MATH 361. Prerequisite: MATH 361 or consent of the Department.

MATH 375. *Geometry I.* ★3 (First Term, 3-0-0). Sensed magnitudes. Cross rates. Transformation theory. Prerequisite: Mathematics 30 or consent of the Department.

MATH 376. *Geometry II.* ★3 (Second Term, 3-0-0). Transformation theory continued. Euclidean construction. Non-Euclidean geometry. Introductory projective geometry. Prerequisite: MATH 375.

MATH 381. *Honors Linear Algebra I.* ★3 (First Term, 3-0-0). General vector spaces and linear transformations, similarity, eigenvalues, characteristic and minimal polynomials, diagonalization, Euclidean linear product and Gram-Schmidt orthogonalization, orthogonal and unitary operators, orthogonal diagonalization, normal operators, spectral theory. Prerequisite: MATH 281. Note: This course is intended for Honors programs. Other students admitted with the consent of the Department.

MATH 382. *Honors Linear Algebra II.* ★3 (Second Term, 3-0-0). Canonical forms for matrices, rational canonical form, invariant factor theorem, elementary divisors, Jordan canonical form; applications to constant coefficient systems of differential equations; numerical methods in linear algebra, approximation of eigenvalues; linear programming. Prerequisite: MATH 282, MATH 381 and a year of calculus.

MATH 400. *Reading in Mathematics.* ★3 (either term, 3-0-0). This course is designed to give credit to mature and able students for reading in areas not covered by courses, under the supervision of a staff member. A student, or group of students, wishing to use this course should find a staff member willing to supervise the proposed reading program. A detailed description of the material to be covered should be submitted to the Chairman of the Department Honors Committee. (This should include a description of testing methods to be used.) The program will require the approval of both the Honors Committee, and the Chairman of the Department. The students' mastery of the material of the course will be tested by a written or oral examination. This course may be taken in either term, and may be taken any number of times, subject always to the approval mentioned above.

MATH 401. *Advanced Calculus and Differential Equations I.* ★3 (First Term, 3-0-0). First and second order differential equations. The Laplace transform. Series solution of differential equations. Method of Frobenius. Special functions. Legendre and Bessel functions. Prerequisite: MATH 303 or equivalent. Note: Credit may not be obtained for both MATH 401 and MATH 431.

MATH 402. *Advanced Calculus and Differential Equations II.* ★3 (Second Term, 3-0-0). Vector analysis. Line and surface integrals. Theorems of Green and Stokes. Applications. Curvilinear coordinates. Jacobians. Boundary value problems. Fourier series. Prerequisite: MATH 401 or MATH 431 or equivalent.

MATH 405. *Honors Complex Variable I.* ★3 (First Term, 3-0-0). Complex number system. Analytic functions. Single- and multi-valued functions, Couchy's theorum and formula. Applications including the maximum modulus principle, Taylor's theorem and Laurent expansion. Harmonic functions. Dirichlet problem for the disk. Series of analytic functions. Calculus of residues. Prerequisite: MATH 308 or 452. Note: This course is primarily for Honors students in Mathematics or Physics.

MATH 406. *Honors Complex Variable II.* ★3 (Second Term, 3-0-0). Conformal mapping. The Schwarz-Christoffel transformation and Dirichlet problem in polygonal domains. Analytic continuation. Mapping problems of analytic functions. Rouche's Theorem. Entire functions. The gamma function. Additional topics to be chosen from the following: Families of analytic functions, asymptotics and special functions. The zeta function and the prime number theorem. Picard's Theorem. Nevanlinna Theory, Hp spaces. Laplace and Mellin transforms. Prerequisite: MATH 405.

MATH 407. *Theory of Functions of a Complex Variable.* ★3 (either term, 3-0-0). Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and contour integration. Conformal mappings. Schwartz-Christoffel transformation. Inverse Laplace transforms. Prerequisite: MATH 303 or equivalent. Note: This course is intended for Science students.

MATH 408. *Theory of Functions of a Complex Variable.* ★3 (either term, 3-0-0). Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and contour integration. Conformal mappings. Schwartz-Christoffel transformation. Inverse Laplace transforms. Prerequisite or corequisite: MATH 315 or consent of the Department. Note: This course is intended for Engineering students.

MATH 409. *Set Theory.* ★3 (First Term, 3-0-0). Axioms for set theory, transfinite induction, cardinal and ordinal numbers, applications. Prerequisite: Consent of the Department. Primarily intended for third and fourth year students with a good background in Mathematics.

MATH 410. *Elementary Topology.* ★3 (Second Term, 3-0-0). Basic properties of topological spaces. Compactness, connectedness and arc wise connectedness. Elements of homotopy theory, covering spaces. Brouwer fixed point theorem. Classification of surfaces. Prerequisite: MATH 308 or MATH 452 or consent of the Department. This course is intended primarily for third and fourth year students with a good background in Mathematics.

MATH 415. *Applied Algebra I.* ★3 (First Term, 3-0-0). Boolean Algebra, switching circuits, graph theory, matrix representations; applications to economics, communication networks and social science. Prerequisite: a single-term course in linear algebra or consent of the instructor.

MATH 416. *Applied Algebra II.* ★3 (Second Term, 3-0-0). Elements of group theory, cosets, Lagrange's theorem, binary group codes, polynomials, finite field theory, error correcting codes. Prerequisite: a single-term course in linear algebra or consent of the instrutor.

MATH 422. *Elementary Differential Geometry I.* ★3 (First Term, 3-0-0). Curves and surfaces in 3-space, differential forms, exterior calculus, integration, vector and tensor fields, frames, Riemannian metrics, geodesics, curvature, local and global geometry of surfaces in 3-space. Prerequisite: MATH 308 and 381 or equivalents.

MATH 424. *Elementary Differential Geometry II.* ★3 (Second Term, 3-0-0). Manifolds, differentiable structure, differential systems, Frobenius theorem, linear connections, Riemannian manifolds, Lie groups, applications in Mathematics and Physics. Prerequisite: MATH 422 or 468 or consent of the Department.

MATH 425. *Honors Abstract Algebra I.* ★6 (3-0-0). Groups, subgroups and normal subgroups, factor groups, homomorphisms. Rings, ideals, quotient rings, homomorphisms, polynomial rings, fields, extensions of fields. Vector spaces and modules. Prerequisite: MATH 282 or consent of the Department.

MATH 427. *Elementary Number Theory.* ★3 (First term, 3-0-0). Divisibility, prime numbers, congruences, quadratic residues, quadratic reciprocity, arithmetic functions and diophantine equations; sums of squares. Prerequisite: One of MATH 281/282 or 274 or 221/328.

MATH 428. *Elementary Field Theory.* ★3 (Second Term, 3-0-0). Fields, Field extensions, ruler and compass constructions, the Galois group, topics for Galois theory, and algebraic number theory. Prerequisite: One of MATH 279, 282 or MATH 328 or equivalent.

MATH 429. *Introduction to Combinatorics.* ★3 (Second Term, 3-0-0). An introduction to the methods and applications of discrete mathematics with topics to include: Enumeration; permutations and combinations, recurrence relations, generating series, the inclusion-exclusion principle. Graph theory; connectivity, matching, chromatic number, planar graphs, paths and cycles. Combinatorial designs; finite geometries, block designs. Applications. Prerequisite: MATH 204 or equivalent.

MATH 431. *Introduction to Differential Equations.* ★3 (First Term, 3-0-0). First order equations, second order equations with constant coefficients. Series solutions, with a brief introduction to separation of variables, application to boundary value

problems of mathematical physics, elementary special functions. Elementary transform techniques. Prerequisite or corequisite: MATH 302 or 307 and MATH 222 or 381.

MATH 432. *Intermediate Differential Equations.* ★3 (Second Term, 3-0-0). Elementary existence and uniqueness theorems. Stability. Perturbation theory. Introduction to numerical methods. Introduction to phase plain analysis. Prerequisite: MATH 431. Prerequisite or corequisite: MATH 303 or 308.

MATH 436. *Introduction to Partial Differential Equations.* ★3 (Second Term, 3-0-0). Introduction to partial differential equations. Cauchy-Kowalewski's theorem, classification of second order linear equations. Elliptic equations (Laplacian and Schrodinger — fundamental solutions, maximal principles, growth estimates). Hyperbolic equations (wave equation characteristics, singularities, Duhamel's principle, Riemann's methods, method of descent). Parabolic equations (heat equation; maximal principles, parametrics). Concept of well-posed problem in the sense of Hadamard. Introduction to numerical methods. Von Neumann criterion. Prerequisite: MATH 431.

MATH 437. *Boundary Value Problems.* ★3 (Second Term, 3-0-0). Boundary value problems of classical Math Physics, orthogonal expansions, classical special functions. Advanced transform techniques. Prerequisite: MATH 431.

MATH 442. *Honors Real Variables I.* ★3 (First Term, 3-0-0). Elements of set theory, cardinality, construction of the real number and the topology of the real line. Baire category theorem. Continuity, semi-continuity and the Darboux property. Monotone functions, bounded variation and absolute continuity. Stone-Weierstrass theorem. Ascoli-Arzela theorem. Riemann-Stieltjes integral. Prerequisite: MATH 308 or equivalent or consent of the Department.

MATH 443. *Honors Real Variables II.* ★3 (Second Term, 3-0-0). Lebesgue measure and the Lebesgue integral on the line. Differentiation of a function of bounded variation, the derivative of an indefinite integral. L1 and L2 spaces, Fourier series and integrals, approximation in L2. Prerequisite: MATH 442.

MATH 445. *Intermediate Mathematics for the Life Sciences I.* ★3 (First Term, 3-0-0). Introduction to linear algebra (matrices, vectors, determinants, eigenvalues), introduction to ordinary differential equations (first and second order equations, linear systems, existence and uniqueness). Applications from the life sciences. Prerequisite: MATH 204 or equivalent and consent of the instructor.

MATH 446. *Intermediate Mathematics for the Life Sciences II.* ★3 (Second Term, 3-0-0). Nonlinear ordinary differential equations (stability, oscillation, phase plane analysis numerical techniques), introduction to difference equations, introduction to probability theory, Numerical interpolation, approximation and solutions to nonlinear algebraic equations. Applications from the life sciences. Prerequisite: MATH 445.

MATH 452. *Analysis I.* ★3 (First Term, 3-0-0). Construction of real numbers, Heine-Borel and related theorems, uniform continuity, series of functions, uniform convergence, Riemann integral, integration of series; metric, topological, Banach and Hilbert spaces, bounded linear operators. Prerequisite: MATH 315 or MATH 303 or equivalent.

MATH 453. *Analysis II.* ★3 (Second Term, 3-0-0). Measurable sets, Lebesgue integrals, linear spaces, and linear operators. Prerequisite: MATH 452.

MATH 459. *Mathematical Programming and Optimization.* ★3 (either term, 3-0-0). Maximizing and minimizing functions of several variables under constraints. Linear programming. The simplex method, and variants. Computational techniques. Nonlinear programming and applications. Prerequisite / corequisite: MATH 281 or 221 / 222; MATH 303 or 308.

MATH 460. *Numerical Analysis.* ★6 (3-0-0). Solution of linear and nonlinear systems, matrix inversion. Eigenvalues and eigenvectors. Polynomial approximation. Differences, interpolation polynomials and aproximate differentiation. Numercial integration. Numerical solution of ordinary and partial differential equations. Prerequisites: MATH 307 / 308.

MATH 466. *Tensor Analysis.* ★3 (First Term, 3-0-0). Algebra of tensors, covariant differentiation in flat space, affine geometry, Riemannian geometry, Lie differentiation, subspaces, differential forms. Prerequisites: MATH 307 / 308 and 381 or equivalents.

MATH 474. *Topics in Geometry.* ★3 (First Term, 3-0-0). A selection from constructability series, dissection theory, projective geometry, non-Euclidian geometry, finite geometrics, homogeneous coordinates, foundations of geometry, topology of two-manifolds. Prerequisite: MATH 375 or equivalent.

MATH 480. *Cartesian Tensors and Applications.* ★3 (First Term, 3-0-0). Euclidean vector spaces. Linear transformations and matrices. Algebra of cartesian tensors. Vector and tensor calculus. Determinants. Structure of second-order tensors. Isotropic tensors. Physical applications. Prerequisite or corequisite: MATH 402 or equivalent.

MATH 491. *Intermediate Mathematical Modelling I.* ★3 (First Term, 3-0-0). This course is designed to develop the student's problem solving abilities along heuristic lines and to illustrate the processes of Applied Mathematics. The students will be encouraged to recognize and formulate problems in mathematical terms, solve the resulting mathematical problems, and interpret the solution in real world terms. Approximately equal time will be devoted to problems arising in each of the physical, chemical, biological, and engineering sciences, and economics. Some of the mathematical tools to be developed include perturbation theory, calculus of variations, dimensional analysis, similarity transforms, dynamic and nonlinear programming, information and game theories. Prerequisites: MATH 221 and 303 or equivalent.

MATH 492. *Intermediate Mathematical Modelling II.* ★3 (Second Term, 3-0-0). This course is a continuation of MATH 491. Problems discussed will be of a more advanced nature requiring a higher degree of mathematical sophistication. Prerequisite: MATH 491.

MATH 495. *Honors Seminar.* ★6 (3-0-0). This course is intended to give students experience with independent reading, and to improve their ability to present and explain mathematical ideas. The course is compulsory for all fourth year Honors students in B.Sc. and B.A. Mathematics, Applied Mathematics, and Mathematical Statistics. Other students admitted by consent of Department.

MATH 500. *Theory of Functions of a Complex Variable.* ★6 (3-0-0). Complex numbers. Complex series. Functions of a complex variable. Cauchy's theorem and the calculus of residues. Integral functions. Conformal representation. The Laplace and Fourier transforms. Prerequisites: MATH 401 / 402 or equivalent. Note: Only one of MATH 500 and 506 / 507 may be taken for credit towards a degree. MATH 500 is not open to graduate students in Mathematics.

MATH 502. *History of Mathematics.* ★6 (3-0-0). The Alexandrian School and the foundations of geometry. Saccheri and the beginnings of modern geometry. The renaissance of algebra in Europe, the Arabic heritage. Cartesian, metric and projective geometries. Development of calculus and mechanics. Logical foundations of mathematics. Prerequisites: MATH 308 and 360 or consent of the Department.

MATH 503. *Integral Transforms.* ★3 (either term, 3-0-0). The Gamma and Hypergeometric Functions. The classical orthogonal polynomials, and the Bessel functions. Prerequisites: MATH 406 and MATH 443 or equivalent.

MATH 504. *Special Functions.* ★3 (Second Term, 3-0-0). An introduction to the Laplace, Fourier, Mellin, and Hankel Transforms with a survey of their basic properties and certain applications. Prerequisites: MATH 406 and 442 / 443 or equivalent.

MATH 505. *Number Systems.* ★6 (3-0-0). The development of the number system from the natural numbers to the complex numbers. Proofs and definitions by induction. General sums and products. Decimal expansion of a real number. Finite, countable, and uncountable sets. Cardinal numbers. Well-ordered sets, ordinal numbers. Prerequisite: MATH 425.

MATH 506. *Complex Variables II.A.* ★3 (First Term, 3-0-0). Cauchy's Theorem, analytic continuation, Riemann surfaces and the monodromy theorem. Normal families, Schlicht functions, conformal transformations and Riemann mapping theorem. Symmetry principle of Schwarz. Prerequisite: MATH 406.

MATH 507. *Complex Variables II.B.* ★3 (First Term, 3-0-0). Modular functions, Picard's theorem, Bloch's theorem, entire and meromorphic functions. Dirichlet series, selected topics from analytic number theory, approximation theory and potential theory. Prerequisite: MATH 506.

MATH 511. *Elementary Number Theory II.* ★3 (First Term, 3-0-0). Arithmetic functions, Dirichlet and unitary convolution, generating series, average order of magnitude and some standard functions. Distribution of the primes, theorems of Chebychev

and Mertens, Selberg's Theorem, elementary proof of the prime number theorem, primes in arithmetic progressions. Partitions: generating functions and combinatorial methods. Prerequisite: MATH 427 or equivalent.

MATH 512. *Algebraic Number Theory.* ★3 (Second Term, 3-0-0). Valuations and their extensions, ramifications; integral dependence, algebraic number fields, ideals and divisors, class number. Prerequisite: MATH 425.

MATH 513. *Additive Number Theory.* ★3 (Second Term, 3-0-0). Addition of sequences, density theorems, essential components, complementary sequences, bases, B2 sequences, representation theorems, arithmetic progressions. Prerequisite: MATH 427 or 511.

MATH 514. *Analytic Number Theory.* ★3 (Second Term, 3-0-0). Analytic proof of the prime number theorem, Weiner-Ikehara theorem; the Hardy-Ramanujan circle method and its applications to partitions and Waring's problem. Prerequisites: MATH 406 and MATH 427 or 511.

MATH 517. *Introduction to Functional Analysis.* ★3 (First Term, 3-0-0). Metric spaces. Completeness and compactness. Fixed points. Continuous operators and metric spaces. Linear and Non-linear spaces. Hilbert spaces. Linear operators and functionals. Approximate solutions of functional equations. Prerequisite: MATH 453 or consent of the Department. Note: MATH 517 is not open to Honors or Graduate students of Mathematics.

MATH 518. *Functional Analysis I.* ★3 (either term, 3-0-0). Locally convex spaces, metrizability. Normed linear spaces and examples. Hahn-Banach theorem. Open mapping theorem. Principle of uniform boundedness. Weak and weak* topologies on Banach spaces. Reflective Banach spaces. Hilbert space theory. Prerequisite: MATH 443 or consent of the Department.

MATH 519. *Functional Analysis II.* ★3 (either term, 3-0-0). Spectrum and resolvent. Fredholm theory of compact operaters. Spectral theorem for bounded self-adjoint linear operators. Banach algebras. Operator algebras. Weak compactness and geometry of Banach spaces. Prerequisites: MATH 518 and MATH 543 or consent of the Department.

MATH 521. *Differential Manifolds.* ★3 (First Term, 3-0-0). Manifolds, differentiable structures and maps, vector bundles, vector and tensor fields, exterior calculus, integral manifolds, integration, basic properties of Lie groups and Lie transformation groups. Prerequisite: Consent of the Department.

MATH 522. *Differential Geometry.* ★3 (either term, 3-0-0). Riemannian geometry: metrics, connections, geodesics, curvature, de Rham theorem. General theory of connections: principal bundles, linear and affine connections, holonomy groups. Lie transformation groups. Selected topics from: Singularities of maps, global analysis, G-structures, symmetric spaces, applications to partial differential equations, physics. Prerequisite: MATH 521.

MATH 524. *Ordinary Differential Equations II.A.* ★3 (First Term, 3-0-0). Existence, extension and uniqueness theorems. Linear systems, stability theory, dynamical systems in the plane. Prerequisite: MATH 431 or equivalent.

MATH 525. *Ordinary Differential Equations II.B.* ★3 (Second Term, 3-0-0). Asymptotics; separation, comparison and oscillation theorems; periodic solutions, boundary value problems; functional differential and contingent equations. Prerequisite: MATH 524.

MATH 526. *Introductory Partial Differential Equations.* ★3 (either term, 3-0-0). Introduction to partial differential equations. First order equations. Classification of higher order equations. Hyperbolic (wave) equations. Elliptic equations and potential theory (Laplace equation). Parabolic (heat and diffusion) equations. Prerequisite: MATH 313 or 401/402 or 431 or equivalent; or consent of the Department. Note: This course is intended primarily for students in Science or Engineering, and concentrates on the practical construction of solutions as well as the determination of general properties of solutions. Graduate students in Mathematics who wish to obtain credit for this course must have consent of the Department.

MATH 527. *Intermediate Partial Differential Equations.* ★3 (either term, 3-0-0). Introduction to the theory of generalized functions. Sobolev spaces; Garding's inequality, existence and regularity theory for elliptic operators. Energy estimates; existence and uniqueness theory for hyperbolic operators. Qualitative properties of solutions. Prerequisite: MATH 436; corequisite: MATH 518; or consent of the Department. Note: This course is intended primarily for students in Mathematics. It is more theoretically oriented than MATH 526.

MATH 528. *Partial Differential Equations.* ★3 (either term, 3-0-0). Continuation of Mathematics 526 or Mathematics 527. Selection of topics will be at the instructor's option in consultation with the students, and may be chosen from the following: further study of elliptic, hyperbolic, and parabolic equations; systems of equations; integral transform methods of solution; integral equation methods; applications to boundary — and initial — value problems; nonlinear operators; approximation methods. Prerequisite: Consent of the Department.

MATH 532. *General Topology I.* ★3 (First Term, 3-0-0). Elementary concepts of topology, nets and filters. Continuity homeomorphisms, product and quotient spaces. Axioms of separation and countability. Compactness, metrization, connectedness.

MATH 533. *Algebraic Topology I.* ★3 (Second Term, 3-0-0). Elementary concepts of homotopy theory; fundamental groups and covering spaces. Simplicial homology.

MATH 534. *Introduction to the Theory of Approximation.* ★3 (First Term, 3-0-0). Polynomial interpolation, remainder formulae and error bounds. Best approximations in C, Lp and other norms. Degree of approximation by polynomials and trigonometric polynomials. Spline interpolation and approximation. Numerical differentiation, quadrature formulae and other applications to numerical analysis. Prerequisite: MATH 443.

MATH 535. *Linear and Non-Linear Approximation.* ★3 (Second Term, 3-0-0). Linear operators. Best approximation in general normed linear spaces. Rational interpolation and approximation. Splines and approximation of linear functionals. Computational aspects, Remes and Polya algorithms. Prerequisite: MATH 534.

MATH 542. *Fourier Analysis.* ★3 (either term, 3-0-0). Trigonometric series. Norm and pointwise convergence theorems. Fourier integral. Inversion theorems. Plancherel's theorem. Hausdorff-Young theorem. Summability of Fourier series. Wiener's Tauberian theorem. Prerequisite: MATH 443 or consent of the Department.

MATH 543. *Measure Theory.* ★3 (either term, 3-0-0). Abstract measures. Integration. L^p spaces. Radon-Nikodym theorem. Hahn and Lebesgue decompostion theorems. Product measures. Fubini's theorem. Prerequisite: MATH 443 or consent of the Department.

MATH 550. *Generalized Dynamics and Special Relativity Theory.* ★6 (3-0-0).

MATH 554. *Theory of Elasticity.* ★6 (3-0-0). Stress, strain, stress-strain relations. Stretching, bending, torsion, and flexure of cylinders. Two-dimensional problems with an introduction to the work of Muskelvili. Introduction to three-dimensional problems. Variational methods. Prerequisite: MATH 406 or 408 or 500 or consent of the Department.

MATH 555. *Hydro- and Aero-Dynamics.* ★6 (3-0-0). Classical hydrodynamics, Kutta-Joukowski theory of airfoils. Boundary layers. Flow of a viscous fluid. Supersonic flow. Shock waves. Prerequisite: Consent of the Department.

MATH 560. *Optimization Techniques.* ★3 (Second Term, 3-0-0). Theory and techniques of dynamic programming. Problems of LaGrange and Mayer. Computational methods resolving optimal problems: Prerequisite: MATH 453 or consent of Department.

MATH 581. *Group Theory and Field Theory.* ★3 (First Term, 3-0-0). Solvable, nilpotent and free groups. Galois theory and valuation theory of fields. Further topics from the theory of groups and fields which may vary from year to year. Prerequisite: MATH 425.

MATH 582. *Rings, Modules and Categories.* ★3 (Second Term, 3-0-0). Noetherian rings, primary decomposition, localization. Injective and Projective Modules. Artin-Wedderburn theorem. Topics from homological algebra and category theory which may vary from year to year. Prerequisite: MATH 425.

MATH 600. *Reading in Mathematics.* ★3 (either term, 3-0-0). Students registered in this course are supervised by individual staff members in areas of interest of the staff members. Students will be allowed to take this course only in exceptional circumstances and with the permission of the Chairman of the Department. This course shall not be counted against the minimum course requirement for graduate students.

MATH 605. *Mathematical Logic.* ★4 (2-0-0).

MATH 617. *Topics in Functional Analysis I.* ★3 (First Term, 3-0-0).

MATH 618. *Topics in Functional Analysis II.* ★3 (Second Term, 3-0-0).

MATH 624. *Combinatorial Analysis.* ★6 (3-0-0).

MATH 626. *Topics in Number Theory I.* ★3 (First Term, 3-0-0).

MATH 627. *Topics in Number Theory II.* ★3 (Second Term, 3-0-0).

MATH 632. *Algebraic Topology II.* ★3 (First Term, 3-0-0).

MATH 633. *General Topology II.* ★3 (Second Term, 3-0-0).

MATH 643. *Topics in Analysis.* ★3 (either term, 3-0-0).

MATH 644. *Topics in Measure Theory.* ★3 (either term, 3-0-0).

MATH 645. *Lattice Theory.* ★3 (either term, 3-0-0).

MATH 663. *Topics in Applied Mathematics I.* ★3 (First Term, 3-0-0).

MATH 664. *Topics in Applied Mathematics II.* ★3 (Second Term, 3-0-0).

MATH 666. *Topics in Mathematical Modelling.* ★3 (either term, 3-0-0). Topics on standard mathematical methods used in modelling, selection at the option of the instructor. Various methodologies or philosophies of model building, techniques for simulation of dynamic systems and axiomatic approaches will be discussed. The course may be run in seminar fashion with an accent on reading current research literature and guest lectures from among the science faculty.

MATH 667. *Topics in Differential Equations I.* ★3 (First Term, 3-0-0).

MATH 668. *Topics in Differential Equations II.* ★3 (Second Term, 3-0-0).

MATH 676. *Topics in Geometry I.* ★3 (First Term, 3-0-0).

MATH 677. *Topics in Geometry II.* ★3 (Second Term, 3-0-0).

MATH 678. *Ring Theory I.* ★3 (First Term, 3-0-0).

MATH 679. *Ring Theory II.* ★3 (Second Term, 3-0-0).

MATH 681. *Topics in Algebra.* ★3 (First Term, 3-0-0).

MATH 682. *Topics in Algebra.* ★3 (Second Term, 3-0-0).

MATH 692. *Topics in Group Theory.* ★3 (First Term, 3-0-0).

MATH 693. *Topics in Group Theory.* ★3 (Second Term, 3-0-0).

MATH 695. *Advanced Relativity Theory.* ★6 (3-0-0).

MATH 900. *Non-Thesis Project.* ★6 (Time equivalent to two single-term courses). Open only to students taking the M.Sc. non-thesis option in Mathematics.

NOTE: For courses offered jointly by the Physics and Mathematics Departments, see § 184.19, Mathematical Physics.

184.21 Meteorology

Department of Geography

METEO 307. *General Meterology.* ★6 (3-0-0). A systematic study of weather elements and atmospheric processes, with emphasis on the underlying physical principles. Atmospheric composition, temperature, humidity, wind stability, cloud forms, precipitation processes, fronts and air masses, and an introduction to the general circulation. The lectures will be supplemented by practical work in weather observing and elementary weather map analysis. Note: A student cannot receive credit for both GEOG 333 and METEO 307. Science students are advised to take METEO 307.

METEO 320. *Meteorological Instrumentation.* ★3 (Second Term, 2-0-2). Theory and practice in the use of common meteorological instruments and in the interpretation of basic weather and climatological data with emphasis on applications in agriculture, forestry, biological and environmental sciences. Measurement problem definition, sampling, sensitivity, response, accuracy, data logging, station networks. Laboratory and outdoor demonstrations and exercises. Field trips required. Prerequisite: GEOG 231 or equivalent.

METEO 406. *Meteorological Thermodynamics and Radiation.* ★3 (First Term, 3-0-0). Principles of thermodynamics, thermodynamics of dry and moist air, thermodynamic diagrams, hydrostatic stability, convection, principles of radiation, solar and terrestrial radiation. Prerequisite or corequisite: MATH 302 and MATH 303 or equivalent.

METEO 407. *Introduction to Atmospheric Dynamics.* ★3 (Second Term, 3-0-0). Kinematics of the atmosphere, equations of motion and their simplification, pressure change, atmospheric interfaces, circulation and vorticity, pressure coordinates, introduction to turbulence. Prerequisite or corequisite: MATH 302 and MATH 303 or equivalent.

METEO 412. *Synoptic Meteorology Laboratory I.* ★3 (First Term, 1-0-3). An introduction to synoptic analysis. Meteorological codes, sea-level map analysis of isobars, air-masses and fronts, stability, constant pressure chart contour and isotherm analysis, cross-sections, differential analysis, thickness charts and thermal winds.

METEO 506. *Reading and Seminar Course in Meteorology.* ★3 (either term, 3-0-0).

METEO 507. *Seminar Course in Meteorology.* ★6 (1-1s-0). General meteorological research.

METEO 511. *Synoptic Meteorology.* ★6 (3-0-0). Structure of the atmosphere. The structure and behavior of weather systems. Planetary scale motion systems. Jet streams. Vertical motion. Condensation phenomena. Meso-scale phenomena.

METEO 512. *Synoptic Meteorology Laboratory II.* ★3 (Second Term, 1-0-3). Complementary to METEO 511 and 525. Advanced synoptic analysis and an introduction to computer methods. Isogone and streamline analysis, frontal contour, vorticity charts, objective analysis, quantitative precipitation forecasting, and barotropic and baroclinic 500-mb prognostic charts.

METEO 515. *Meteorological Statistics.* ★3 (Second Term, 3-0-0). Application of statistics to meteorology. Fourier analysis, factor analyses, multiple discriminant analysis and curve fitting by regression. Variance spectrum analysis of time series.

METEO 516. *Physical Meteorology.* ★3 (First Term, 3-0-0). Meteorology of the stratosphere and meso-sphere, composition, thermal structure, winds, variability, radiative processes, ozone, radar meteorology, introduction to atmospheric electricity.

METEO 517. *Cloud Physics.* ★3 (Second Term, 3-0-0). Condensation of water vapor in the atmosphere, condensation nuclei, growth of droplets from the vapor, statistical growth of drops by collection, ice nuclei, ice formation, snow crystals, growth of hail, numerical modelling of cumulus clouds and precipitation, artificial modification of clouds.

METEO 525. *Atmospheric Turbulence and Diffusion.* ★3 (First Term, 3-0-0). Viscosity. Navier-Stokes Equations. Reynolds stresses. Kolmogorov hypotheses. Monin-Obukhov similarity theory. Plume rise. Atmospheric transport and diffusion of mass. Numerical boundary-layer modelling.

METEO 526. *Advanced Topics in Dynamic Meteorology.* ★3 (Second Term, 3-0-0). Numerical weather prediction. Atmospheric energy and energy transformations. General circulation models. Gravity and inertia waves. Stability analysis of linear models.

184.22 Microbiology

MICRB 201. *Elementary Microbiology.* ★3 (Second Term, 3-0-3). An introduction to the microbial world, with emphasis on the general characteristics of microorganisms as affecting their relationship with man and other organisms. Note: Offered to students in Agriculture and Forestry, and as a Natural Science option to students in Arts. Not available to students in Science.

MICRB 315. *General Microbiology I.* ★3 (either term, 3-0-3). The organization, morphology and cell structure of microorganisms with emphasis on bacteria and fungi. Microbial growth and its control, aspects of medical and applied microbiology and microbial ecology will be discussed. Laboratory exercises are designed to demonstrate basic microbiological techniques as well as relevant microbial activities and functions.

MICRB 365. *General Microbiology II.* ★3 (Second Term, 3-0-3). An introduction to the metabolic and physiological activities of microorganisms, with emphasis on their interactions with other microorganisms, higher plants, animals, and the environment. Discussion of the mode of action of antibiotics and other metabolic inhibitors and the basic properties of viruses, virus infection and replication. Laboratory exercises are designed to introduce students to current techniques and phenomena related to the lecture material. Prerequisites: MICRB 315;

BIOL 297 or GENET 351. Corequisite: BIOCH 300 (or equivalent) or consent of the Department.

MICRB 403. *Microbial Taxonomy.* ★3 (First Term, 3-0-0). The history, principles, and methods of microbial classification and nomenclature. Prerequisites: MICRB 315, 365.

MICRB 406. *Seminar.* ★6 (0-3s-0). Note: Senior Honors students only.

MICRB 411. *Microbial Physiology.* ★3 (First Term, 3-0-0). The structure, growth, and metabolic pathways used by bacteria, yeasts, and molds. Emphasis is placed on the comparative biochemical aspects of microbial life. Prerequisites: MICRB 315, 365, BIOCH 300 or consent of the Department.

MICRB 413. *Microbial Physiology Laboratory.* ★3 (First Term, 0-6L-0). Laboratory exercises introduce the microanalytical techniques used for measuring microbial growth and for following metabolic events at the cellular and subcellular level. Prerequisite or corequisite: MICRB 411.

MICRB 414. *Molecular Biology of Bacterial Viruses.* ★3 (First Term, 3-0-3). The structure and replication of viruses. Prerequisite: BIOCH 300 or equivalent. Recommended: MICRB 315, 365 and GENET 351.

MICRB 424. *Animal Virology.* ★3 (First Term, 3-0-3). The characterization, classification, and replication of animal viruses, together with experimental approaches to the use of various tissue culture systems in virology. Prerequisites: An introductory course in microbiology or bacteriology; BIOCH 300 or equivalent which may be taken concurrently.

MICRB 432. *Microbial Metabolism.* ★3 (Second Term, 3-0-0). Comparative aspects of the metabolic pathways used by autotrophic microorganisms for growth on unique energy sources. Ecological implications of such pathways also will be discussed. Prerequisite: MICRB 411 or consent of Department.

MICRB 444. *Microbial Laboratory Techniques.* ★6 (Second Term, 1-0-9). Current techniques used in the growth of procaryotic cells and the isolation and characterization of their macromolecular constituents e.g. enzymes, DNA and ribosomes. Prerequisite: MICRB 413 or consent of the Department.

MICRB 490. *Microbial Ecology and Taxonomy.* ★3 (Second Term, 3-0-3). A study of the major groups of microorganisms stressing their occurrence and biochemical activities in natural environments. Prerequisites: University courses in microbiology and biochemistry or consent of the Department.

MICRB 495. *Special Projects.* ★6 (0-0-6). Directed laboratory studies under supervision of staff members. Note: Primarily for senior specialization students.

MICRB 496. *Special Projects.* ★9 (0-0-9). Directed laboratory studies under supervision of staff members. Note: Primarily for senior specialization students.

MICRB 497. *Special Projects.* ★12 (0-0-12). Directed laboratory studies under supervision of staff members. Note: Primarily for senior specialization students.

MICRB 503. *Research.* ★6 (0-0-6). (See § 183.15.1).

MICRB 504. *Research.* ★9 (0-0-9). (See § 183.15.1)

MICRB 505. *Research.* ★12 (0-0-12). (See § 183.15.1)

MICRB 506. *Cellular Control Mechanisms.* ★3 (Second Term, 0-0-6).

MICRB 507. *Graduate Seminar.* ★6 (0-3s-0).

MICRB 508. *Recent Developments in Virology.* ★3 (either term, 3-0-0). Note: Offered alternate years.

MICRB 510. *Structure of Microorganisms.* ★3 (Second Term, 3-0-3).

MICRB 515. *Biosynthesis of Microbial Metabolites.* ★3 (Second Term, 3-0-0). Microbial production of organic acids, antibiotics, vitamins, enzymes, and steroids. Emphasis will be placed on control and regulation of metabolic pathways involved in the formation of these microbial products. Prerequisites: MICRB 315, 365, BIOCH 300 or equivalents.

For an additional course in Microbiology see INT D 505 in § 184.4

NOTE: Not all graduate courses are offered every year.

Microbiology (Immunology Listings)

MICRB 370. *Basic Immunology.* ★3 (First Term, 3-0-3). Elementary level introduction to immunological concepts, such as serology, immuno-chemistry, hypersensitivity and anaphylaxis. Immunological regulatory mechanisms will also be discussed. Prerequisites: University courses in chemistry and biology.

MICRB 401. *Immunology.* ★3 (Second Term, 3-0-0). Molecular aspects of immunology. Qualitative and quantitative reactions, properties and structures of antibodies and antigens. Prerequisite: MICRB 315/365 (or equivalent) and a university course in Biochemistry, or consent of the Department.

MICRB 405. *Immunology Laboratory.* ★3 (Second Term, 0-0-3). Laboratory exercises to demonstrate quantitation of the immune response and the isolation and characterization of antigens. Offered as Special Project to a very restricted number of students. Approval of instructor required. Corequisite or prerequisite: MICRB 401.

MICRB 512. *Immunogenesis.* ★3 (Second Term, 3-0-0). The phylogenesis and ontogenesis of the immune response. Prerequisite: MICRB 470 or consent of the Department. See ZOOL 512.

MICRB 600. *Immunobiology.* ★0 (Second Term, 0-1s-0). An advanced seminar series for staff and students, which emphasizes a theme, or limited number of themes. The seminars are intended as explorations of the biological significance of advances in immunology, and as probes of medical problems in immunology. Prerequisite: Consent of the Department.

NOTE: For other Immunology courses not listed above, see: GENET 470 (Immunogenetics); IMMUN 500 (see § 124.8 Faculty of Medicine calendar).

NOTE: Credit may be given in appropriate cases for courses in Microbiology other than those listed above, e.g.: Food Science 461, 462; Soils 430; Botany 341, 342; Bacteriology 361, 425, 426, 504, 505, 506, 508-12, 530, 531.

184.23 Paleontology

Departments of Geology and Zoology

PALEO 418. *Paleontology of the Lower Vertebrates.* ★3 (First Term, 3-0-3). Evolution of fish-like vertebrates, amphibians, reptiles and birds, with emphasis on systematics, major adaptive shifts and subsequent evolutionary radiation. Prerequisite: GEOL 310 or ZOOL 325 or ZOOL 304 and 305.

PALEO 419. *Paleontology of the Higher Vertebrates.* ★3 (Second Term, 3-0-3). The Mesozoic history of mammals as illustrative of the origin and evolution of a higher taxon; adaptive radiation of Tertiary mammals, with special emphasis on insectivores, primates, carnivores, proboscidians, and ungulates. Prerequisite: GEOL 310 or ZOOL 325 or ZOOL 304 and 305.

PALEO 514. *Advanced Paleontology.* ★3 (Second Term, 3-0-0). Contemporary aspects of theoretical Paleontology, including: functional morphology, adaptation and evolution in invertebrate and vertebrate fossils; and distribution of fossils as evidence for continental drift. Prerequisite: GEOL 414 or ZOOL 352/353 or consent of the instructors.

PALEO 620. *Problems in Vertebrate Paleontology.* ★3 (0-1s-0). Prerequisites: PALEO 418 and 419.

184.24 Pharmacology

Department of Pharmacology, Faculty of Medicine

PMCOL 222. *Drugs, Medicines and Man.* ★3 (either term, 3-0-0). This course is designed to acquaint the student with limited Scientific background with many aspects of the drug use and abuse in our society. Some of the topics to be covered will include mind-altering drugs, treatment of pain, herbal and folk medicine, antibiotics, nerve gases and insecticides, food additives and vitamins, over-the-counter drugs, poisons, and toxins, and health quackery. This course will be given in participation with the Faculty of Pharmacy and Pharmaceutical Sciences. Prerequisite: None.

PMCOL 432. *General Pharmacology.* ★6 (3-0-3). The pharmacological action of drugs, emphasizing basic pharmacological principles as applied to representative drugs having their primary actions on various organ systems of the body. Classes of drugs studied include anaesthetics

central nervous system excitants, drugs acting on the autonomic nervous system, cardiovascular and diuretic drugs, chemotherapeutic agents. In addition the toxicology of the above and some other selected agents is emphasized. Prerequisites or corequisites: BIOCH 300 and PHYSL 410 and consent of the Department.

PMCOL 435. *Experimental Procedures in Pharmacology.* ★3 (either term, 0-1s-6). A laboratory course intended primarily for honors pharmacology students and advanced students in related disciplines. Using both intact and isolated tissue preparations students will perform a variety of experiments of types commonly encountered in applied pharmacology and in pharmacological research. The laboratory sessions will include didactic material and instruction in: animal handling, humane methods of euthanasia, anaesthesia, body fluid sampling, administration of drugs and elementary surgical and dissection techniques required in the experiments. Prerequisite: Consent of the Department. Previous instruction in mammalian physiology is recommended.

PMCOL 436. *Analytical Techniques in Pharmacology.* ★3 (either term, 0-0-6). Emphasis will be on the use of modern analytical techniques as they are applied to pharmacological problems. The course will include practical instruction and experiments in such techniques as spectrophotometry, spectrofluorimetry, chromatography, subcellular fractionation, gel electrophoresis, electron microscopy and several others. Prerequisite: Consent of the Department.

PMCOL 498. *Pharmacology Research Program.* ★6 (0-0-6). During their fourth year all honors candidates are required to carry out a program of directed research under the supervision of a staff member. This program will be related to the special interests of the student and will involve experimental work as well as a written report on the part of the student. Note: Honors students only. Prerequisite: Consent of the Department.

PMCOL 499. *Pharmacology Honors Seminar.* ★0 (0-1s-0). All fourth year honors students will be required to present at least one seminar based upon a selected topic from the literature or from their research project during the course of the academic year. Note: Honors students only.

GRADUATE COURSES

NOTE: Not all graduate courses are offered every year. The Chairman of the Department should be consulted regarding the prerequisites for, and availability of, graduate courses in any academic session.

PMCOL 501. *Pharmacology Tutorial, Research and Reading Course.* ★3 (First Term, 3-0-0).

PMCOL 502. *Pharmacology Tutorial, Research and Reading Course.* ★3 (Second Term, 3-0-0).

PMCOL 508. *Molecular Pharmacology.* ★3 (either term, 3-0-0).

PMCOL 509. *Neuropharmacology.* ★3 (either term, 3-0-0).

PMCOL 510. *Advanced Topics.* ★3 (First Term, 3-0-0).

PMCOL 511. *Advanced Topics.* ★3 (Second Term, 3-0-0).

PMCOL 555. *Introduction to Clinical Pharmacology for the Anaesthetist.* ★3 (First Term, 2-0-0).

PMCOL 600. *Seminar in Pharmacology.* ★0 (0-1s-0).

PMCOL 601. *The Actions of Drugs on Membranes.* ★3 (either term, 3-0-0).

PMCOL 602. *Clinical Pharmacology.* ★3 (either term, 2-0-0).

Note: § 184.25 Reserved.

184.26 Physical Science

Department of Physics

PH SC 341. *Physical Science.* ★6 (3-0-0). A course designed to give non-science students some appreciation of fundamental ideas and methods in the physical sciences, their history and development, modern trends in these fields, and their relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy, and Geology. Note: (1) May not be used for credit towards a B.Sc. degree. (2) May not be taken for credit by students who have credit in any university physics course.

184.27 Physics

184.27.1 OPTION COURSES

The following is a list of courses which are offered for students seeking a Science option for their program, i.e., Arts, Business Administration and Commerce, Education, etc. These courses with the exception of Physics 369, do not meet the laboratory science requirements in the Faculty of Arts but may be taken as non-laboratory science courses in that Faculty.

NOTE: (1) These courses are not available for credit to students registered in the Faculty of Science. (2) Astronomy courses offered by the Department of Physics are listed in § 184.3.

PH SC 341. *Physical Science.* ★6 (3-0-0). A course designed to give non-science students some appreciation of fundamental ideas and methods in the physical sciences, their history and development, modern trends in these fields, and their relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy, and Geology.

PHYS 269. *The Physics of Music and High-Fidelity.* ★3 (Second Term, 3-0-0). Waves and sound, complex waves and musical instruments, the nature of music, decibels, loudspeakers, electricity and amplifiers, heat production, electromagnetism and cartridges, records and tape decks. Note: Credit may be obtained in only one of PHYS 269 or 369.

PHYS 342. *Contemporary Physics.* ★6 (3-0-0). A largely non-mathematical course aimed at providing non-science students with a basic framework of fundamental laws upon which the technology of modern life is based. Currently important topics such as conventional and nuclear energy production, resources and hazards will be discussed. Modern technological applications (e.g., lasers, computers, satellites, communication, transistors) are included. Additional topics will depend on student interest.

PHYS 369. *Physical Aspects of Music and High Fidelity.* ★3 (Second Term, 3-0-3). A lecture and lab course designed to illustrate the concepts of waves, sound, electricity and magnetism as applied to musical instruments, amplifiers, tuners, records and tape decks. Note: Credit may be obtained in only one of PHYS 369 or 269.

184.27.2 GENERAL INTEREST COURSES

The following courses are intended for students registered in Arts, Education, Biological Sciences, Medical Sciences and the B.Sc. (General) program. These courses will stress physical concepts rather than mathematical sophistication.

ASTRO 253. *Astronomy.* ★6 (3-0-0). This is a general course in astronomy. Major topics presented include the solar system, properties of stars, galaxies and cosmology. The results from manned and unmanned space probes are included in the discussions. Emphasis is placed on the physical processes responsible for astronomical phenomena. Prerequisite: Mathematics 30 and Physics 30 or PHYS 203. Students are advised to have knowledge of trigonometry.

PHYS 203. *Introductory General Physics I (Mechanics).* ★4 (First Term, 4-1s-3). A non-calculus course in physics for students *without* Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles, oscillations. Prerequisite: Mathematics 30. This course is intended to be taken in sequence with PHYS 207 and/or 209. Credit may be obtained for only one of PHYS 203, 205, or 212.

PHYS 205. *Introductory General Physics I (Mechanics).* ★3 (First Term, 3-0-3). Course contents same as PHYS 203 but designed for students who have taken Physics 30. Prerequisite: Physics 30, Mathematics 30. Credit may be obtained for only one of PHYS 203, 205, or 212.

PHYS 207. *Introductory General Physics II (Matter, Sound, Heat and Optics).* ★3 (Second Term, 3-0-3/2). Properties of gases, liquids and solids, wave motion and sound, heat, and thermodynamics, geometrical and physical optics. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 207 and 212.

PHYS 209. *Introductory General Physics III (Electricity, Magnetism and Atoms).* ★3 (Second Term, 3-0-3/2). The nature of electricity and magnetism, AC currents, electromagnetic waves, atomic and nuclear structure. Prerequisite: PHYS 203 or 205. Credit may not be obtained for both PHYS 209 and 212.

PHYS 212. *Basic General Physics.* ★6 (3-0-3). Physics 212 utilizes some calculus. Topics include mechanical, thermal, electromagnetic and optical properties of matter; the forms and transformations of energy; introduction to the atomic theories of modern physics. Prerequisites: Physics 30; Mathematics 30. Corequisites: MATH 202, 204. Credit may be obtained for only one of PHYS 203, 205 or 212.

PHYS 301. *Quantum Aspects of Modern Physics.* ★3 (First term, 3-0-3/2). Experimental evidence leading to the development of quantum mechanics including the photo-electric effect, the Compton effect, Xray production and electron diffraction. A discussion of the Heisenberg uncertainty principle and the Schrodinger theory of quantum mechanics including applications of one dimensional potential wells and barriers, tunnelling, the simple harmonic oscillator. Prerequisites: First year physics course(s) (two-term); MATH 204.

PHYS 303. *Relativistic Aspects of Modern Physics.* ★3 (Second Term, 3-0-0). Topics included are limitations of classical physics; Einstein's special theory; length contraction; time dilation; twin paradox; equivalence of mass and energy; relativistic mass and momentum. The General Theory of Relativity including deflection of light, black holes, models of the universe and curvature of space. Prerequisite: First year physics course(s) (two-term).

PHYS 304. *Revolutions in Physics.* ★6 (3-0-0). Discussion of the way scientists were forced to change their concepts that caused the major revolutions in physics and the accompanying reverberations in the non-scientific world. Illustrations from celestial motion, Newtonian synthesis, theory of relativity, the probabiliatic nature of quantum mechanics. Prerequisite: First year physics course(s) (two-term).

PHYS 313. *Thermal Physics with Biological Applications.* ★3 (First Term, 3-0-0). Applications of elementary probability to biopolymers, solute flow and diffusion across membranes. Thermal equilibrium. Ideal gas. Simple crystals. Entropy and the Second Law of Thermo-dynamics. Free energies. Applications to solutions of organic molecules in simple liquids, DNA replication and oxygen in haemoglobin. Prerequisites: First year physics course(s) (two-term); MATH 204.

PHYS 319. *Physical Principles of Electron Microscopy.* ★3 (Second Term, 3-0-0). Provides a fundamental physical understanding of all the important types of image contrast obtainable from both biological and physical specimens. Applications of current developments in high resolution, scanning, scanning transmission and high voltage electron microscopy are covered. Prerequisite: PHYS 207 or 209.

PHYS 361. *Physics of the Energy Question.* ★3 (First Term, 3-0-0). Energy in its various forms. Energy conversion. Nuclear fission and fusion. Nuclear power, its advantages and limitations. Heat engines, refrigerators and their efficiencies. Electric power generation. Earth's energy balance, thermal pollution. Growth of the world's population and energy consumption. Energy sources, transient and continuous (solar energy). Technology of energy use. Energy conservation and the economics of energy use. Prerequisite: First year physics course(s) (two-term).

PHYS 363. *Applications of Physics to Environmental Problems.* ★3 (Second Term, 3-0-0). Radiation and climate. Body heat balance and energy exchange. Space heating. Interaction of radiation with matter. Environmental and human health impacts of power production. Noise. Air pollution. Transportation, the automobile and mass transportation. Technology and applications of solar energy. Prerequisite: First year physics course(s) (two-term).

PHYS 401. *Nuclear Physics and Elementary Particles.* ★3 (Second term, 3-0-3/2). Topics include the properties and structure of the nucleus; radioactivity, carbon dating, tracer techniques; nuclear fission; fusion; nuclear reactors; elementary particles and particle accelerators. Prerequisite: PHYS 301.

PHYS 403. *Atomic Molecular and Solid State Physics.* ★3 (Second Term, 3-0-3/2). Topics in atomic physics: Thomson's and Rutherford's model of the atom, experimental aspects of atomic spectra, the Bohr model, atomic structure based on the Schrodinger wave equation, electron spin, the Pauli exclusion principle and characteristic Xray spectra. Topics in molecular physics: a discussion of bonding in molecules and the basis for understanding molecular structure from both the experimental and theoretical points of view. Topics in solid state physics: elementary statistical mechanics, properties of metals, insulators, semi-conductors; specific heat and magnetic properties of solids; superconductivity. Prerequisite: PHYS 301.

184.27.3 SPECIALIZATION AND HONORS COURSES

The following courses are for students registered in various specialization and honors programs in the Faculty of Science. Detailed Programs of Study are listed in § 183.1. Students are referred to § 184.3 for Astronomy Courses and § 184.27.2 for General Interest Physics Courses.

PHYS 242. *Mechanics, Electricity and Magnetism.* ★6 (3-1s-3). Kinematics; particle dynamics; work and energy; linear momentum; gravitation; oscillations; charge; electric field; Gauss's law; electric potential; capacitance; currents and resistance; EMF and DC circuits; magnetic field; Ampere's law; Faraday's law; inductance. Prerequisites: Physics 30 and Mathmatics 30. Corequisites: MATH 202(203)/204.

PHYS 311. *Heat, Thermodynamics and Kinetic Theory.* ★3 (Second Term, 3-0-0). Temperature, specific heats, phase changes. First and second laws of thermodynamics. Derivation and application of Maxwell's relations. Elementary kinetic theory. Prerequisite: PHYS 242. Prerequisites or corequisites: MATH 302/303 or 307/308.

PHYS 340. *Heat, Electricity and Magnetism.* ★6 (3-0-3). Designed to follow Physics 242 and to give a foundation in physics suitable for work in other physical sciences. Electrostatics, potential, capacitors, D.C. circuits, magnetism, and magnetic field, electro-magnetism, induced E.M.F., self-inductance, introduction to alternating currents. Elementary atomic and nuclear physics; heat and thermodynamics. Prerequisite: PHYS 242. Corequisites: MATH 302/303 or 307/308. Credit may not be obtained for both PHYS 340 and 382.

PHYS 343. *Mechanics.* ★3 (Second Term, 3-0-0). Particle dynamics, central forces, planetary motion; Rutherford scattering; potential theory; damped and forced harmonic oscillators; wave motion; vibrating strings and normal modes. Prerequisites: PHYS 242; MATH 313 or 431. Corequisite: MATH 303 or 308.

PHYS 351. *Relativity.* ★3 (Second Term, 3-0-0). Postulates of Special and General relativity including acceleration, four vectors, energy and momentum, relativistic connection between electric and magnetic fields, curved space, gravitation and black holes. Prerequisites: PHYS 231/233 or 242, MATH 204.

PHYS 371. *Introductory Atomic and Nuclear Physics.* ★3 (Second Term, 3-0-0). Thermal radiation and the quantum theory. Planck's radiation law; photoelectric and compton effects; Bohr atom; periodic table; X-rays. Prerequisite: PHYS 242. Corequisite: PHYS 340 or 382.

PHYS 382. *Electricity and Magnetism.* ★4 (2-0-0). A basic course in electricity and magnetism. Maxwell's equations and magnetism. Maxwell's equations in integral form will be developed from the experimental evidence. Methods for treating DC and AC electric circuits and the properties of dielectrics will be included in the development. Prerequisite: PHYS 242. Corequisites: MATH 302/303 or 307/308. Credit may not be obtained for both PHYS 340 and 382.

PHYS 390. *Physics Laboratory A.* ★3 (0-0-4.5). Experiments in mechanics, atomic physics, electricity and magnetism. Prerequisites or corequisites: PHYS 343, and 340 or 382.

PHYS 461. *Physical Optics.* ★3 (First Term, 3-0-0). Complex optical systems; Fresnel and Fraunhofer diffraction; polarization; interaction of light and matter; thin films, lasers and holography. Prerequisite: PHYS 340 or 382.

PHYS 471. *Quantum Mechanics A.* ★3 (Second Term, 3-0-0). Wave packets, Fourier transforms, group velocity, etc. The basic postulates of quantum mechanics. Solutions of the Schrodinger equations in three dimensions angular momentum, square well, harmonic oscillator, hydrogen atom. Prerequisite: PHYS 340 or 382. Corequisite: MATH 402 or 437.

PHYS 482. *Electromagnetic Theory.* ★6 (3-0-0). Laplace's and Poisson's equations applied to simple cases. Maxwell equations and solutions under various boundary conditions, transmission lines, wave guides, and antennae. Theory of dielectrics and magnetic media. Introduction to plasma physics. Prerequisite: PHYS 340 or 382. Corequisites: MATH 401 / 402 or 431 / 437.

PHYS 493. *Instrumentation.* ★4 (First Term, 3-0-6). Amplification, feedback and switching. Examples will be taken from analog and digital computer applications. Prerequisite: PHYS 340 or 382. Credit may not be obtained for both Physics 493 and 495.

PHYS 495. *Instrumentation and Electronics.* ★3 (First Term, 3-0-3). This course consists of Physics 493 lectures plus selected experiments from the Physics 493 laboratory. Prerequisite: PHYS 340 or 382. Credit may not be obtained for both PHYS 493 and 495.

PHYS 497 *Physics Laboratory.* ★3 (Second Term, 0-0-6). A continuation of PHYS 493 with experiments in optics, electricity and magnetism. This course is intended for students in the Honors and Specializaion programs. Prerequisite: PHYS 493 or 495. Corequisite: PHYS 482.

PHYS 511. *Statistical Physics I.* ★3 (First Term, 3-0-0). Kinetic theory of gases, canonical distribution and applications, grand canonical ensemble. Prerequisites: PHYS 311, 471; MATH 402 or 437.

PHYS 513. *Statistical Physics II.* ★3 (Second Term, 3-0-0). Quantum statistics, black body radiation, Debye theory of solids, ortho and para-hydrogen, Fermi theory of B-decay. Prerequisite: PHYS 511.

PHYS 515. *Introductory Solid State Physics.* ★3 (First Term, 3-0-0). Crystal structure; crystal diffraction and reciprocal lattice; specific heat of a solid; Einstein and Debye models, free-election theory of metals; band theory of solids; semi-conductors. Prerequisite: PHYS 471.

PHYS 517. *Introduction to Low Temperature Physics.* ★3 (Second Term, 3-0-0). Third law of thermodynamics with applications; production and measurement of low temperature; properties of matter at low temperature; superfluidity of helium; superconductivity; nuclear orientation. Corequisite: PHYS 513.

PHYS 545. *Theory of Classical Fields.* ★3 (Second Term, 3-0-0). Lagrangian and Hamiltonian formulations for continuous systems and fields; field equations; Schrodinger field; Scalar field, conservation laws. Prerequisites: PHYS 482 and MA PH 444.

PHYS 561. *Atomic Spectroscopy.* ★3 (either term, 3-0-0). Quantum-mechanical basis of atomic spectra, selection rules for electric dipole transportations; the vector model for one- and two-electron spectra; coupling conditions; magnetic field effects; introduction to complex spectra; hyperfine structure. Prerequisites: PHYS 461 and 471.

PHYS 563. *Physics of Stellar Atmospheres.* ★3 (either term, 3-0-0). Introduction to stellar spectra; theory of excitation and ionization; emission and absorption of radiation, continous spectra; model stellar atmospheres; the Fraunhofer spectrum. Prerequisite: PHYS 561.

PHYS 565. *Physics of Stellar Interiors.* ★3 (either term, 3-0-0). Stellar interiors and nuclear transformation; model stars; variable stars; novae and supernovae. Prerequisites: PHYS 371, and MATH 402 or 437.

PHYS 571. *Quantum Mechanics B.* ★3 (First Term, 3-0-0). Review of the physical basis of quantum mechanics; matrix formulation; angular momemtum; perturbation theory; collision theory; the many-particle Schrodinger equation identical particles; spin and statistics; atomic and molecular systems. Prerequisite: PHYS 471.

PHYS 573. *Nuclear and Particle Physics.* ★3 (First term, 3-0-0). Nuclear systematics; nuclear dimensions; semiempirical mass formula; electromagnetic moments; radioactive decay; nucleon-nucleon interactions; the deuteron; neutron-proton and proton-proton scattering; nuclear models; nuclear reactions; introduction to fundamental particles. Prerequisite: PHYS 471 or 475.

PHYS 574. *Radiation Physics.* ★6 (3-0-0). X-rays and radioactivity, with emphasis on their biological effects and medical uses. Production, properties and uses of radioactive isotopes. Prerequisite: PHYS 471.

PHYS 591. *Advanced Laboratory.* ★3 (First Term, 0-6L-0). Open-ended experiments in atomic, nuclear and solid state physics. Prerequisites: PHYS 482, 490 and 493.

PHYS 593. *Instrumentation B.* ★3 (Second Term, 3-0-0). Topics in instrument design in several fields of experimental physics. Prerequisite: PHYS 482 and 493.

PHYS 599. *Special Projects.* ★3 (Second Term, 0-6L-0). Experimental or reading project under the direction of a staff member. This course is intended for Honors physics students. Prerequisite: Consent of the Department.

For Graduate courses in Physics refer to § 204.67.2 of the Faculty of Graduate Studies and Research Calendar.

NOTE: For courses offered jointly by the Mathematics and Physics Departments, see § 184.19, Mathematical Physics.

184.28 Physiology

PHYSL 403. *Neurophysiology.* ★3 (First Term, 3-0-0). An advanced course in neurophysiology aimed at giving students a thorough understanding of the integrative mechanisms in the visual and somaesthetic systems and the nervous control of movement. Prerequisites: PHYSL 410 or equivalent and consent of the instructor. Offered alternate years to PHYSL 505.

PHYSL 404. *Cardiovascular Physiology.* ★3 (Second Term, 3-0-0). The course will emphasize general concepts in human cardiovascular physiology: properties of the myocardium, hemodynamics and control of the cardiovascular system; applications in the response to exercise, hemorrhage and cardiac failure; hypertension. Prerequisites: PHYSL 410 or equivalent and consent of the instructor. Offered alternate years to PHYSL 501.

PHYSL 410. *Physiology.* ★6 (3-0-3; 3-0-0). Available for Graduate and Science students. Prerequisites: BIOL 130 or 299, CHEM 200 and 250 or 350.

PHYSL 501. *Topics in Cardiovascular Physiology.* ★3 (Second Term, 3-0-0). Recent research material from selected topics in cardiovascular physiology will be presented in seminar form by the participating students. Prerequisites: PHYSL 404 and consent of the instructor. Offered alternate years to PHYSL 404.

PHYSL 502. *Problems in Current Research.* ★3 (either term, 0-0-3). Students will be assigned to one or more staff members according to their interests, to become familiar with particular research problems, techniques and relevant literature. A critical report of the student's work, including the historical background of the project is required of each student. Consult Chairman of Department.

PHYSL 503. *Biophysics of Nerve and Muscle.* ★3 (Second Term, 3-0-0). An integrated series of lectures and demonstrations covering such topics as membrane structure and function, nervous conduction, synaptic transmission, modern concepts of muscle, special senses, neural control and communication. Emphasis is on the mathematical and physical approach with reference to current literature. Prerequisites: Consent of the instructor. Students must have an adequate background in Physiology and related subjects.

PHYSL 504. *Physiology of Reproduction.* ★3 (Second Term, 3-0-0). Review of the physiology of human reproduction with consideration of other mammals and birds. Prerequisites: PHYSL 401, 410, 411 or ZOOL 440 and consent of the instructor. BIOCH 300 or 372 desirable as prerequisites or to be taken concurrently.

PHYSL 505. *Topics in Neurophysiology.* ★3 (First Term, 3-0-0). Recent research material in a wide range of topics in neurophysiology will be presented in seminar form by the participating students. Prerequisites: PHYSL 403 and consent of the instructor. Offered alternate years to PHYSL 403.

PHYSL 506. *Tutorial and Seminar Course.* ★3 (either term, 0-3s-0). Seminars, tutorials and guided reading in selected topics. Prerequisite: PHYSL 410, 411 and one of PHYSL 501, 502, 503, 504 and 505. Consult Chairman of Department.

PHYSL 600. *Physiology Seminar.* ★0 (0-1s-0). Honors and graduate students are required to attend for at least one year.

184.29 Plant Physiology and Biochemistry

Departments of Botany and Plant Science

PL SC 431. *Plant Biochemistry.* ★3 (First Term, 3-0-3). An introduction to biochemistry. Basic biochemical similarity of all organisms. Ways of studying biochemical reactions. Natures and kinds of enzymes; qualitative aspects of rates of enzyme catalyzed reactions. Derivation of energy through degradative processes. Chemical natures of carbohydrates, lipids, and proteins. Prerequisites: CHEM 200 or 202 and CHEM 250 or 350, or consent of the instructor.

PL SC 432. *Plant Biochemistry.* ★3 (Second Term, 3-0-3). A continuation of Plant Science 431. Emphasis is on the utilization of energy for synthetic processes. Biochemistry of lipids and related cell constituents. Chemistry and biochemistry of cellular structures. Photosynthesis. Nitrogen biochemistry. Regulation and control of chemical reactions in living organisms. Prerequisite: PL SC 431 or equivalent.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and methods of investigation in these fields. Offered alternate years. Prerequisite: Consent of the instructors; BIOCH 300 and 372 or PL SC 431 and 432 or equivalent recommended. (Not offered in 1980-81.)

184.30 Psychology

NOTE: Students with credit in Psychology 202/212, or Educational Psychology 269/271 may not take Psychology 260 or 261 for degree credit. Psychology 261 replaces Psychology 237, 241 and 283.

PSYCO 260. *Basic Psychological Processes.* ★3 (either term, 3-0-0). Principles and development of perception, motivation, learning, and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 306. *Honors Seminar.* ★3 (First Term, 0-3s-0). Note: Required of all second year students enrolled in Honors Psychology.

PSYCO 307. *Honors Seminar.* ★3 (Second Term, 0-3s-0). Note: Required of all second year students enrolled in Honors Psychology.

PSYCO 309. *Statistical Methods for Psychological Research.* ★3 (either term, 3-0-1). Application of statistical methods to psychological problems; description of psychological data in terms of averages, measures of variability, and measures of relationships; problems of sampling theory and tests of statistical hypotheses. Prerequisite: Mathematics 30, MATH 100 or consent of the Department. See § 182.2 (7) re statistics courses.

PSYCO 352. *Behavior in Relation to Genetics.* ★3 (either term, 3-0-0). An examination of the influence of genetic variations on behavioral differences in infrahuman and human populations. Prerequisites: PSYCO 260/261 and PSYCO 309 and BIOL 297 or consent of the Department.

PSYCO 360. *General Experimental Psychology.* ★3 (either term, 3-0-3). A course designed for the Arts concentration covering the application of experimental methods to a wide variety of psychological problems. Prerequisite: PSYCO 260.

PSYCO 361. *Principles of Behavior Change.* ★3 (either term, 3-0-0). An introduction to behavior change techniques. The course will examine the origin of such techniques in animal experimentation and learning theory, and an evaluation of their effectiveness when applied to specific problem populations. Prerequisite: PSYCO 260. Note: Students cannot receive credit for both PSYCO 365 and 361.

PSYCO 362. *Learning and Memory.* ★3 (Second Term, 3-0-0). An examination of perceptual learning, stimulus coding, associative learning, and organizational factors involved in learning and memory. Prerequisites: PSYCO 260 and 309. Note: Students cannot receive credit for both PSYCO 365 and 362.

PSYCO 366. *Experimental Psychology: Perception.* ★3 (either term, 3-0-3). Perception. Prerequisite: PSYCO 260. Corequisite: PSYCO 309 or consent of the Department. Note: Students cannot receive credit for both PSYCO 366 and 367.

PSYCO 367. *Perception.* ★3 (either term, 3-0-0). An introduction to theoretical and experimental issues associated with sensory and perceptual experience. Prerequisite: PSYCO 260. Corequisite: PSYCO 309, or consent of the Department. Note: Students cannot receive credit for both PSYCO 366 and PSYCO 367.

PSYCO 368. *Theories and Principles of Learning.* ★3 (either term, 3-0-0). An examination of the classical theories and contemporary developments in the field of learning. Theoretical and empirical issues arising from research on infrahuman animals will be emphasized. Prerequisite: PSYCO 260; Corequisite: PSYCO 309 or consent of the Department.

PSYCO 375. *Brain and Behavior.* ★3 (either term, 3-0-0). Introduction to brain function related to sensation, movement, learning, motivation, and thinking. Prerequisite: PSYCO 260.

PSYCO 402. *Recent Advances in Experimental Psychology I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

PSYCO 403. *Recent Advances in Experimental Psychology II.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

PSYCO 406. *Honors Seminar.* ★3 (First Term, 0-3s-2). Note: Required of all third-year students enrolled in Honors Psychology.

PSYCO 407. *Honors Seminar.* ★3 (Second Term, 0-3s-2). Note: Required of all third-year students enrolled in Honors Psychology.

STAT 419. *Intermediate Statistical Methods in Psychological Research.* ★3 (Second Term, 3-0-0). The application of probability theory to psychological problems. Correlation and regression techniques. Note: This course is open to students concentrating in Psychology. Prerequisite: PSYCO 309 or STAT 255.

PSYCO 433. *Test Theory.* ★3 (either term, 3-0-0). Principles of diagnosis and prediction, and the assessment of tests. Emphasis upon the concepts of "validity" and "reliability" with lesser treatment of multiple regression and factor analysis. Prerequisite: PSYCO 309 or consent of the Department.

PSYCO 463. *Psychology of Languages.* ★3 (either term, 3-0-0). An introduction to the psychology of language acquisition and use. Prerequisite: PSYCO 362 or consent of the Department.

PSYCO 464. *Human Performance.* ★3 (First Term, 0-3s-2). A survey of contemporary problems, issues, experimentation, and theories relating to human performance. Special emphasis on man as an information processor. Prerequisite: One of PSYCO 358, 360, 361, 362, 366, 367 or 368.

PSYCO 465. *Cognitive Processes.* ★3 (Second Term, 3-0-3). An introduction to complex conceptual processes, and information processing theories. Topics include: concept formation, problem solving, and psycholinguistics. Prerequisite: PSYCO 362 or 365. Note: Offered every other year.

PSYCO 466. *Advanced Perception.* ★3 (Second Term, 3-0-0). Detailed coverage of selected perceptual systems. Prerequisite: PSYCO 366 or 367. Note: This course is offered every other year.

PSYCO 467. *Determinants of Perceptual Experience.* ★3 (Second Term, 3-0-0). Nature of perceptual experience with particular emphasis on physiological, environmental, social, personal, cultural and ontogenic determinants. Prerequisite: PSYCO 366 or 367. Note: This course is offered every other year.

PSYCO 468. *Motivation.* ★3 (either term, 3-0-0). An examination of motivation from a behavioral perspective. Emphasis will be placed on the integration of findings with general theories of behavior. Offered in alternate years. Prerequisites: PSYCO 260 and 368.

PSYCO 474. *Comparative Psychology.* ★3 (Second Term, 2-2s-0). A discussion of the development, mechanisms, adaptive significance, and evolution of animal behavior. Prerequisite: PSYCO 260.

PSYCO 475. *Biological Bases of Behavior.* ★3 (First Term, 0-0-4). Basic neuroanatomy and neuropsychology of sensory and motor systems. Prerequisite or corequisite: PSYCO 375.

PSYCO 476. *Physiological Psychology.* ★3 (Second Term, 3-0-3). Neuropsychology of learning, memory, and motivation. Prerequisite: PSYCO 475.

PSYCO 477. *Human Neuropsychology.* ★3 (Second Term, 3-0-0). Changes in mood, motivation, perception, attention, memory and language as revealed by studies of structural alterations in the brain. Prerequisite: PSYCO 260.

PSYCO 488. *Abnormal Human Behaviour and Brain Chemistry.* ★3 (First Term, 3-0-0). The relationship between changes in human behaviour induced by environmental and genetic factors and the chemistry of the brain. Examples from the various forms of mental illness, movement and perceptual disorders, aging and mental retardation. Prerequisite: PSYCO 260, 261.

PSYCO 496. *Individual Research I.* ★3 (First Term, 1-0-3). A course designed to allow the senior undergraduate to pursue a research topic in more depth than the classroom structure permits. Prerequisite: Consent of the Department.

PSYCO 497. *Individual Research II.* ★3 (Second Term, 1-0-3). A course designed to allow the senior undergraduate to pursue a research topic in more depth than the classroom structure permits. Prerequisite: Consent of the Department.

PSYCO 503. *Systems of Psychology.* ★3 (Second Term, 3-0-0). A study of modern systems in Psychology.

PSYCO 504. *Conference Course in Psychology.* ★3 (First Term, 3-0-3).

PSYCO 505. *Conference Course in Psychology.* ★3 (Second Term, 3-0-3).

PSYCO 530. *Experimental Design.* ★6 (3-0-0). Note: Required of all graduate students in Psychology. Prerequisite: Consent of the Department.

PSYCO 531. *Advanced Scaling Theory.* ★3 (either term, 3-0-0). Contemporary theories and methods of metric and nonmetric scaling.

PSYCO 532. *Multivariate Methods in Psychology.* ★3 (Second Term, 3-0-0). Theory and practice of factor analysis and related multivariate methods in their application to psychological data. Prerequisite: PSYCO 530 (or concurrent registration) or consent of instructor.

PSYCO 533. *Theory of Data Analysis.* ★3 (Second Term, 3-0-0). Data-processing methods in psychology, including scaling and measurement, formal character of data configurations, detection, and interpretation of data patterns, and the role of "models" in data analysis.

PSYCO 560. *Memory and Cognition.* ★3 (Second Term, 3-0-0). Psychological functions in the processing of information for memory and other cognitive activities.

PSYCO 561. *Advanced Psychology of Learning.* ★3 (First Term, 3-0-0). Principles of basic behavior theory with special emphasis on contemporary problems in animal learning.

PSYCO 562. *Advanced Psychology of Perception.* ★3 (Second Term, 3-0-0). A study of research and methods in Psychology of Perception.

PSYCO 563. *Psychophysics.* ★3 (First Term, 3-0-0). Theoretical and methodological issues in psychophysical research. Emphasizes contemporary problems in the measurement of sensory attributes and the construction of mathematic models of psychophysical relations.

PSYCO 564. *Sensory Processes.* ★3 (First Term, 3-0-0). Sensory processes underlying learning, perception and motivation.

PSYCO 565. *Seminar in Learning Theory.* ★3 (either term, 0-3s-0). Prerequisite: Advanced standing in Psychology.

PSYCO 567. *Psychology of Development.* ★3 (First Term, 3-0-0). A discussion of basic psychological processes in development.

PSYCO 568. *Seminar in Psychology of Development.* ★3 (either term, 0-3s-0).

PSYCO 569. *Cognition.* ★3 (Second Term, 3-0-0). Study of the psychology of knowing.

PSYCO 570. *Drugs and Behavior.* ★3 (either term, 3-0-0). Prerequisites: PSYCO 489, and PSYCO 475, or a course in Neuropsychology.

PSYCO 575. *Advanced Physiological Psychology.* ★3 (Second Term, 3-0-0). Brain mechanisms underlying perception, motivation, learning and memory.

PSYCO 576. *Human Neuropsychology.* ★3 (either term, 3-0-0). A study of complex human behavior from the viewpoint of experimental neuropsychology.

PSYCO 577. *Seminar in Physiological Psychology.* ★3 (either term, 0-3s-0). Prerequisite: PSYCO 476 or consent of the Department.

PSYCO 578. *Experimental Psychopathology.* ★3 (either term, 3-0-3). Scientific validation of psychoanalytic theory, perceptual studies of psychiatric patients, and experimental attempts to relate psychotherapy and learning theory. Prerequisites: PSYCO 489 and one course in experimental psychology, or consent of the Department. Prerequisite: PSYCO 366.

PSYCO 582. *Multivariate Psychology.* ★3 (Second Term 3-0-0). A survey of contemporary research in perception, learning, behavior genetics, personality, intelligence with emphasis on the relationship of methodology and empirical findings.

PSYCO 585. *Seminar in Theories of Perception.* ★3 (0-3s-0).

PSYCO 599. *Honors Thesis.* ★6 (0-0-6). Students in their fourth year of honors will pursue a research project under the direction of a member of the Department.

PSYCO 610. *Special Topics in Learning.* ★3 (First Term, 3-0-0).

PSYCO 611. *Topics in Learning.* ★3 (Second Term, 3-0-0).

PSYCO 612. *Topics in Perception.* ★3 (First Term, 3-0-0).

PSYCO 613. *Topics in Perception.* ★3 (Second Term, 3-0-0).

PSYCO 631. *Special Topics in Theoretical Psychology I.* ★3 (First Term, 0-3s-0).

PSYCO 632. *Special Topics in Theoretical Psychology II.* ★3 (Second Term, 0-3s-0).

PSYCO 633. *Special Topics in Psychological Statistics.* ★3 (either term, 3-0-0).

PSYCO 648. *Research.* ★3 (First Term, 3-0-3).

PSYCO 649. *Research.* ★3 (Second Term, 3-0-3).

PSYCO 660. *Seminar in Theory Construction: Analysis.* ★3 (First Term, 0-3s-0).

PSYCO 661. *Seminar in Theory Construction: Synthesis.* ★3 (Second Term, 0-3s-0).

PSYCO 670. *Seminar in Theoretical Psychology.* ★3 (0-3s-0).

PSYCO 698. *Advanced Research Techniques I.* ★3 (First Term, 0-3L-0).

PSYCO 699. *Advanced Research Techniques II.* ★3 (Second Term, 0-3L-0).

184.31 Statistics

NOTE: See § 182.2 (7) regarding statistics courses offered by Departments in the Faculty of Science and elsewhere.

STAT 241. *Introduction to Statistics.* ★3 (either term, 3-0-2). Random variables and frequency distributions. Averages and variance. The binomial and normal distribution. Sampling distributions and elementary inference. The X^2-test for contingency tables. Regression and correlation. Analysis of variance. Prerequisite: Mathematics 30 or consent of the department. This course may not be taken for credit if credit has already been obtained in any of STAT 255, 335, 336, 337, 365.

STAT 255. *Elementary Statistics.* ★6 (3-0-3). Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regresssion and correlation. Signficance tests. Applications to data in various fields. Prerequisite: Mathematics 30 or equivalent. This course may not be taken for credit if credit has already been obtained in any of STAT 241, 335, 336, 337, 365.

STAT 335. *Probability, Statistics, and Programming.* ★3 (First Term, 3-0-2). The calculus of probability. Binomial, multinomial, Poisson, and normal distributions. Estimation. Tests of hypothesis and confidence limits. Tests of control and control charts. Sampling plans and sequential sampling. Computer programming with applications to Statistics. Prerequisite: A knowledge of basic programming. This course is intended primarily for Engineering students. This course may not be taken for credit if credit has already been obtained in STAT 336, 337 or 365.

STAT 336. *Introduction to Statistics.* ★3 (either term, 3-0-1). Frequency distributions, measures of central tendency and dispersion, sampling distributions, inference on means and proportions, analysis of variance, regression and correlation, contingency tables. Difficulties in applying these techniques will be illustrated by examples chosen subject to the students' backgrounds. Prerequisite: Mathematics 30 or consent of the department. This course may not be taken for credit if credit

has already been obtained in any of STAT 241, 255, 335, 337, 365.

STAT 337. *Biostatistics.* ★3 (either term, 3-0-1). Frequency distributions, measures of central tendency and dispersion, methods of sampling biological populations, sampling distributions, elementary inference on means and proportions, analysis of variance, regression and correlation, contingency tables. The concepts will be motivated by problems in the life sciences. Difficulties in actual applications will be stressed. Prerequisite: Mathematics 30 or consent of the department. This course may not be taken for credit if credit has already been obtained in any of STAT 241, 255, 336, 365.

STAT 365. *Elements of Probability Theory.* ★3 (First Term, 3-0-0). Finite probability spaces; random variables, random vectors and probability distributions on finite spaces; introduction to discrete and continuous random variables. Prerequisite: MATH 204 or equivalent.

STAT 366. *Elements of Statistics.* ★3 (Second Term, 3-0-2). Principles of statistical inference on finite sample-spaces; introduction to statistical inference on discrete and continuous space; some common statistical procedures. Prerequisite: STAT 365.

STAT 419. *Intermediate Statistical Methods in Psychological Research.* ★3 (Second Term, 3-0-0). The application of probability theory to psychological problems. Correlation and regression techniques. Introduction to the analysis of variance and non-parametric techniques. Note: This course is open only to students concentrating in Psychology. Prerequisite: PSYCO 309 or STAT 255.

STAT 441. *Applied Statistical Methods.* ★3 (First Term, 3-0-0). Methods in applied statistics including regression techniques, analysis of variance and covariance, elementary analysis of time series, and methods of data analysis. Applications are taken from the Social and Physical Sciences and Commerce. Prerequisite: STAT 241, 255, 336, or 337 or equivalent. Note: This course is not available to a student in the Honors or Specialization programs in Mathematics and/or Statistics.

STAT 461. *Sampling Techniques.* ★3 (either term, 3-0-0). Simple random sampling from finite populations, stratified sampling, regression estimators, cluster sampling. Note: This course may only be offered in alternate years. Prerequisite: An elementary statistics course.

STAT 465. *Introduction to Applied Statistics I.* ★3 (First Term, 3-0-0). Linear models and least square theory. Linear and non-linear regression problems. Analysis of variance and co-variance. Design of experiments. Sampling methods. Prerequisites: STAT 366 and MATH 243 or 221 or equivalent.

STAT 466. *Introduction to Statistical Inference.* ★3 (Second Term, 3-0-0). Foundations of statistical inference. Point estimation, properties of estimates. Multivariate normal distribution. Testing statistical hypotheses, likelihood ratio test, Chi-square t- and F-test. Confidence intervals. Prerequisite: STAT 471.

STAT 471. *Introduction to Probability I.* ★3 (First Term, 3-0-0). Probability spaces, algebra of events. Elements of combinatorial analysis. Conditional probability, stochastic independence. Special discrete and continuous distributions. Random variables, moments, transformations. Basic limit theorems. Prerequisites: STAT 365, MATH 302/303 or consent of the Department.

STAT 472. *Introduction to Probability II.* ★3 (Second Term, 3-0-0). Sequences of Bernoulli trials, laws of large numbers, normal approximations. Generating functions, recurrent events, random walks. Introduction to Markov chains. Special topics. Prerequisite: STAT 471.

STAT 475. *Multivariate Analysis.* ★3 (either term, 3-0-0). The multivariate normal distribution, multivariate regression and regression and analysis of variance, classification, canonical correlation, principal components, factor analysis, introduction to multivariate computer packages. Note: This course may be offered only in alternate years. Prerequisite: Two single-term courses in linear algebra, and STAT 465.

STAT 477. *Non-Parametric Inference.* ★3 (either term, 3-0-0). Tests for randomness, goodness of fit, tests for location and scale, non-parametric estimators. Robust statistics. Introduction to computer packages for non-parametric statistics. Note: This course may be offered only in alternate years. Prerequisite: An elementary course in statistics.

STAT 479. *Time Series Analysis.* ★3 (either term, 3-0-0). Stationary series, spectral analysis, models in time series: autoregressive, moving average, ARMA and ARIMA. Smoothing series, computational techniques and computer packages for time series. Note: This course may be offered only in alternate years. Prerequisite: Consent of instructor.

STAT 558. *Techniques of Statistical Analysis I.* ★3 (First Term, 3-0-0).

STAT 559. *Techniques of Statistical Analysis II.* ★3 (Second Term, 3-0-0). The contents of these courses will be selected each year from such applied topics as: Sampling methods, Multi-variate Analysis, Nonparametric methods, Combinatorial methods, and Analysis of Design. Prerequisites: STAT 450 or 471 or 466 or equivalent, and consent of the Department.

STAT 561. *Sample Survey Methodology.* ★3 (either term, 3-0-0). Simple random sampling. Stratified random sampling. Ratio and regression estimates. Cluster sampling: single stage, two stage and multistage sampling. Systematic sampling. Prerequisite: STAT 466 or consent of the Department.

STAT 563. *Theory of Games.* ★3 (either term, 3-0-0). Games in normal and extended form. Methods of solution. Statistical games. Minimax strategies. Bayes solutions. Linear programming. Prerequisite: STAT 471 or consent of the Department.

STAT 566. *Mathematical Methods of Statistics I.* ★3 (Second Term, 3-0-0). Probability distributions; Exponential family of distributions. Completeness. Uniformly minimum variance unbiased, maximum likelihood and other estimators. Neyman-Pearson Lemma, UMP tests, sequential tests, UMP similar and unbiased test. Confidence regions. Concepts of Decision Theory. Prerequisite: STAT 466 and STAT 571 or consent of the Department.

STAT 567. *Mathematical Methods of Statistics II.* ★3 (First Term, 3-0-0). Prior and posterior distributions. Bayes and mimimax procedures. Invariant procedures. Bayesian inference for linear models. Prerequisite: STAT 566 or consent of the Department.

STAT 568. *Analysis of Variance.* ★3 (either term, 3-0-0). The general linear model. Confidence Ellipsoids and tests under normal theory. One and two way analysis of variance. Multiple comparisons. Complete higher-way models. Random effects models. Analysis of covariance. Prerequisite: STAT 466 or equivalent or consent of the Department.

STAT 569. *Experimental Design.* ★3 (either term, 3-0-0). Latin squares. Balanced and partially balanced incomplete blocks. Nested and partially nested models. Two level factorial experiments. Confounding. Higher level factorial designs. Prerequisite: STAT 568 or equivalent.

STAT 571. *Probability Theory I.* ★3 (First Term, 3-0-0). Probability spaces, introduction to measure and integration, random variables, types of stochastic convergence. Distribution functions and characteristic functions. Weak limit theorems. Prerequisite: STAT 472 or consent of the Department.

STAT 572. *Probability Theory II.* ★3 (Second Term, 3-0-0). Zero-one laws, three-series criterion, laws of iterated logarithm, Central Limit Problem, conditional expectation. Introduction to stochastic processes. Martingales and Markov processes. Prerequisite: STAT 571.

STAT 575. *Multivariate Analysis.* ★3 (First Term, 3-0-0). Multivariate normal distribution, estimation of the mean vector and the covariance matrix. The distribution of the sample covariance matrix and the sample generalized variance, Hotelling's T2. Discriminant analysis. Some statistical applications. Prerequisites: STAT 466 and MATH 381/382.

STAT 577. *Nonparametric Inference.* ★3 (Second Term, 3-0-0). Order statistics, rank-tests, Kolmogorov-Smirnov tests. Nonparametric estimation. Nonparametric problems of analysis of variance and of multivariate analysis. Tests for independence. Efficiency of tests and other large-sample properties. Other nonparametric procedures. Prerequisite: STAT 566 or consent of the Department.

STAT 578. *Regression Analysis.* ★3 (either term, 3-0-0). The general linear hypothesis. Ordinary least squares in multiple linear regression. Selecting the best regression equation. Generalized least squares. Partial and multiple correlation. Linear functional relationships when the independent variables are also random. Nonlinear estimation and models. Prerequisite: STAT 466.

STAT 579. *Time Series Analysis.* ★3 (either term, 3-0-0). The autocorrelation function and spectrum and their estimates. Linear stationary models; autoregressive, moving average and mixed models. Linear nonstationary models

autoregressive integrated moving average models. Forecasting. Model identification and estimation. Spectral analysis. Prerequisite: STAT 466 or equivalent or consent of the Department.

STAT 580. *Stochastic Processes.* ★3 (either term, 3-0-0). Elements of stochastic processes. Discrete and continuous time Markov Chains; Birth and Death processes. Branching processes. Brownian Motion. General Stationary and Markov processes. Examples. Prerequisite: STAT 471 or consent of the Department.

STAT 661. *Stochastic Processes I.* ★3 (First Term, 3-0-0).

STAT 662. *Stochastic Processes II.* ★3 (Second Term, 3-0-0).

STAT 666. *Topics in Statistics I.* ★3 (First Term, 3-0-0).

STAT 667. *Topics in Statistics II.* ★3 (Second Term, 3-0-0).

STAT 671. *Topics in Probability I.* ★3 (First Term, 3-0-0).

STAT 672. *Topics in Probability II.* ★3 (Second Term, 3-0-0).

STAT 900. *Non-Thesis Project.* ★6 (Time equivalent to two single-term courses). Open only to students taking the M.Sc. non-thesis option in Mathematics and/or Statistics.

184.32 Zoology

NOTE A: For junior courses see Biology § 184.5.

NOTE B: A list of Paleontology courses and course descriptions may be found under § 184.23 Paleontology.

NOTE C: See also courses listed under Marine Science in § 184.18.

184.32.1 SENIOR COURSES

Note A: See also senior biology courses under § 184.5.

Note B: Not all senior courses are offered every year. Check with Zoology Office (BioSciCW312) for current offerings.

ZOOL 304. *The Chordates I.* ★3 (First Term, 3-0-3). The comparative anatomy and phylogeny of the protochordates, fishes and amphibians. Prerequisites: BIOL 296, 297, 298 and 299. Note: Designed for Honors students in Zoology. Open to Specialization students in Zoology by request. Others take Zoology 325/326.

ZOOL 305. *The Chordates II.* ★3 (Second Term, 3-0-3). The comparative anatomy and phylogeny of reptiles, birds and mammals. Prerequisite: ZOOL 304.

ZOOL 325. *Comparative Anatomy of the Vertebrates.* ★3 (First Term, 3-0-3). Comparative anatomy of the vertebrates with special emphasis on the mammals. Prerequisites: two of BIOL296, 297, 298 or 299, or BIOL 130 and one of BIOL 296, 297, 298 or 299 taken as a corequisite, or consent of the Department.

ZOOL 326. *Biology of the Vertebrates.* ★3 (Second Term, 3-0-3). Topics in vertebrate biology, including zoogeography, population ecology, reproduction, and structural and behavioral adaptations. Prerequisite: ZOOL 325 strongly recommended, or consent of the Department.

ZOOL 340. *Principles of Animal Physiology.* ★3 (Second Term, 3-0-3). A survey of physiological systems with emphasis on their experimental study. Examples are chosen from vertebrates and invertebrates. Designed for zoology honors and specialization students. Prerequisites: BIOL 299 and 301 or consent of the Department.

ZOOL 341. *Vertebrate Physiology.* ★3 (First Term, 3-0-0). Functional biology at the organ system level. Prerequisites: BIOL 299 or 301 and one of BIOL 296, 297, or 298, or consent of the Department.

ZOOL 350. *Survey of the Invertebrates.* ★3 (Second Term, 3-0-3). The functional anatomy and life cycles of the major invertebrate taxa are emphasized. Prerequisites: Two of BIOL 296, 297, 298, or 299 or consent of the Department. Not designed for Zoology Honors students.

ZOOL 352. *The Invertebrates I.* ★3 (First Term, 3-0-3). The lower invertebrate phyla and Deuterostomia. Prerequisites: BIOL 296, 297, 298, and 299 or consent of the Department. Note: Designed for Honors students in Zoology and Entomology. Open to Specialization students in Zoology by request. Others take ZOOL 350.

ZOOL 353. *The Invertebrates II.* ★3 (Second Term, 3-0-3). The Protostomia. Prerequisite: ZOOL 352, or consent of the Department.

ZOOL 360. *Man and Biosphere.* ★3 (Second Term, 3-0-0). A consideration of man's place in the biosphere and of the biological bases of environmental problems including population, pollution, and consideration of renewable and aesthetic resources. Prerequisite: One full year of university level biology, preferably including BIOL 298 or equivalent.

ZOOL 404. *Natural History of the Vertebrates of Alberta.* ★3 (Second Term, 3-0-3). General survey of the vertebrate fauna of Alberta. Prerequisites: ZOOL 304/305 or 325.

ZOOL 405. *Ichthyology.* ★3 (First Term, 3-0-3). Prerequisite: ZOOL 304 or 325.

ZOOL 406. *Ornithology.* ★3 (First Term, 3-0-3). Prerequisites: ZOOL 304/305 or 325.

ZOOL 408. *Mammalogy.* ★3 (Second Term, 3-0-3). Prerequisites: ZOOL 304/305 or 325.

ZOOL 411. *Embryology.* ★3 (First Term, 3-0-3). Prerequisites: BIOL 302 and ZOOL 304/305 or 325/326 or consent of the Department.

ZOOL 412. *Experimental Embryology.* ★3 (Second Term, 3-0-3). Prerequisite: ZOOL 411 or consent of the Department. Offered alternate years.

ZOOL 421. *Mechanisms of Evolution.* ★3 (First Term, 3-0-0). Prerequisites: BIOL 296, 297 and 298, or consent of the Department.

ZOOL 430. *Experimental Zoology.* ★3 (Second Term, 3-0-3). Emphasis is on the design of experiments and analysis of data collected from field and laboratory studies in Zoology. Prerequisite: STAT 337, or consent of the Department.

ZOOL 435. *Principles of Zoological Systematics.* ★3 (Second Term, 3-1s-0). An introduction to the principles, methods, and practical applications of zoological systematics, including classification, phylogeny, and zoogeography. Special emphasis is placed on the theories of and controversy surrounding the phenetic, cladistic, and synthetic schools of taxonomy. Prerequisite: Consent of the Department. Offered in alternate years.

ZOOL 441. *Comparative Animal Physiology I.* ★3 (First Term, 3-0-3). Water and solute metabolism, circulation, respiration, energy metabolism and temperature regulation in major animal phyla. Prerequisites: BIOL 299; BIOL 301 or a course in biochemistry; ZOOL 304/305 or 325, and ZOOL 350, or 352/353, or consent of the Department. Note: Designed for Honors students and others with particular interests in animal physiology.

ZOOL 442. *Comparative Animal Physiology II.* ★3 (Second Term, 3-0-3). Excitation and conduction, neural and endocrine control and coordination in major animal phyla. Prerequisites: BIOL 299; BIOL 301 or a course in Biochemistry; ZOOL 304/305 or 325, and ZOOL 350 or 352/353, or consent of the Department. Note: Designed for Honors students and others with particular interests in animal physiology.

ZOOL 451. *Aquatic Invertebrates of Alberta.* ★3 (First Term, 3-0-3). A seminar and special projects course with emphasis on groups other than insects. Prerequisite: ZOOL 350 or 352/353.

ZOOL 452. *Principles of Parasitism.* ★3 (First Term, 3-0-3). Host and parasite adaptations; relationships with other forms of symbiosis; effects on host and parasite; parasitism and disease. Prerequisites: BIOL 298; ZOOL 350 or 352/353. Note: ZOOL 352 may be taken as a corequisite with consent of the Department.

ZOOL 453. *Protozoology.* ★3 (First Term, 3-0-3). Emphasizes morphology, life cycles, and ecology of free living and parasitic protozoa. Prerequisites: ZOOL 350 or 352/353, or consent of the Department. Given in alternate years.

ZOOL 454. *Wildlife Parasitology.* ★3 (Second Term, 3-0-3). Morphology, life cycles, pathogenicity and ecology of parasites of fish, birds and mammals, with special reference to those found in wildlife of Alberta. Prerequisite: ZOOL 452.

ZOOL 460. *Marine Biology.* ★3 (Second Term, 3-0-3, plus two week field trip). General parameters of marine environments; specific adaptations of animals to different marine habitats, particularly the littoral zones; exploitation and conservation of the ocean. The field trip to the west coast follows the Second Term examinations. The laboratory emphasizes identification of Pacific Coast fauna in preparation for the field trip. Prerequisites: ZOOL 352/353 and consent of the Department.

Note: Enrollment is absolutely limited to 25 students; Zoology Honors students and graduate students will be given first priority, others if space permits.

ZOOL 461. *Marine Biology.* ★3 (Second Term, 3-0-0). Marine environments; adaptations of animals to different marine habitats; exploitation and conservation of the oceans. Prerequisite: ZOOL 350 or 352/353, or consent of the Department.

ZOOL 462. *Animal Ecology.* ★3 (First Term, 0-0-6). Field course in animal ecology. Designed for Honors students in Zoology. Open to Specialization students in Zoology by request. Prerequisites: ZOOL 350 or 352/353, plus one of ZOOL 404, 406 or 408, or consent of the Department. Enrollment is limited to 15 students and Honors students in Zoology will be given priority.

ZOOL 463. *Principles of Ecology.* ★3 (Second Term, 3-0-3). Emphasis on population and community ecology. Discussion of major factors and processes influencing population dynamics and community structure. Laboratory exercises designed to expose students to use of the computer, hypothesis testing, data analysis and critical evaluation of research literature. The course is intended to complement the material covered in BOT 322. Prerequisites: BIOL 298 and one year of college mathematics.

ZOOL 464. *Limnology.* ★3 (First Term, 3-0-3). Emphasis on nutrient cycling in lakes, whole-lake models, phytoplankton-zooplankton interactions, predictive limnology. It is recommended that students registering in limnology have taken introductory statistics.

ZOOL 466. *Boreal Ecology II.* ★3 (Second Term, 3-0-0). Terrestrial and aquatic ecosystems of the north, emphasizing special features of the environment and biotic responses. Prerequisite: BIOL 298, or consent of the Department. Note: For Boreal Ecology I see GEOG 465, 466.

ZOOL 467. *Wildlife Conservation.* ★3 (First Term, 3-0-3). Principles and concepts involved in the conservation and management of wild birds and mammals. Prerequisites: ZOOL 406 and 408, or ZOOL 404, or AN SC 351 and consent of the Department.

ZOOL 468. *Problems in Wildlife Conservation.* ★3 (Second Term, 0-3s-0). A seminar and reading course dealing with current problems in the conservation and management of wild birds and mammals. Prerequisite: ZOOL 467 and consent of the Department.

ZOOL 472. *Animal Behavior I.* ★3 (First Term, 3-0-3/3). An introduction to basic concepts and problems in animal behavior. Prerequisites: ZOOL 304/305 or 325, or consent of the Department.

Zool 474. *Animal Behavior II.* ★3 (Second Term, 0-1s-4). Individual laboratory projects, and seminars dealing with the project topics, and other areas of behavioral research. Prerequisite: ZOOL 472 or consent of Department.

ZOOL 482. *Comparative Vertebrate Histology.* ★3 (Second Term, 3-0-3). A comparative study of the structure and function of vertebrate organ systems at the cellular and histological level. Prerequisites: ZOOL 304/305, or 325.

ZOOL 498. *Honors Colloquium.* ★0 (First Term, 0-3s-0). A tutorial course dealing with selected topics in zoology, particularly as represented by the activities of the staff. Recommended for second or third year students. Only open to Honors students.

184.32.2 HONORS AND GRADUATE COURSES

ZOOL 501. *Honors Research.* ★6 (0-0-6). A means whereby fourth-year students in the Honors program may elect to undertake an individual research project equivalent to two single-term courses. Registration in this course will be contingent upon a faculty member agreeing to supervise the project.

ZOOL 512. *Immunogenesis.* ★3 (Second Term, 3-0-0). The phylogenesis and ontogenesis of the immune response. Prerequisite: MICRB 370 or 401 or GENET 470 or consent of the Department. Offered in alternate years.

ZOOL 520. *Seminar in Zoology.* ★0 (0-1s-0). Note: Strongly recommended for all fourth year Honors and first year graduate students.

ZOOL 529. *Special Problems in Zoology.* ★3 (either term, 3-0-0). Registration will be contingent on the student's having made prior arrangements with a faculty member willing to teach the course. Credit for this course may be obtained more than once.

ZOOL 530. *Individual Study.* ★3 (either term, 3-0-0). Registration will be contingent on the student's having made prior arrangements with a faculty member willing to supervise the program. Credit for this course may be obtained more than once.

ZOOL 540. *Environmental Physiology.* ★3 (First Term, 3-0-0). The influence of environmental variables on animal function. Prerequisite: ZOOL 340, 441 or 442, or consent of the Department. Offered in alternate years.

ZOOL 561. *Seminar in Advanced Animal Ecology.* ★3 (Second Term, 0-3s-0). Prerequisite: ZOOL 462, or BOT 322 or ENT 560.

ZOOL 571. *Advanced Animal Behavior.* ★3 (Second Term, 3-0-0). Discussion of topics and problems most characteristic of invertebrate behavior (vertebrate behavior treated in Zoology 471), such as kineses, taxes, complex orientation, species specific behavior, social phenomena and communication. Prerequisite: ZOOL 471 or 472, or consent of the Department. Offered in alternate years.

ZOOL 572. *Ecological Aspects of Behavior.* ★3 (First Term, 0-3s-0). Seminars concerning behavioral problems with ecological implications. Prerequisite: ZOOL 471 or 472, or consent of the Department.

ZOOL 605. *Seminar in Fish Ecology and Systematics.* ★3 (Second Term, 0-3s-0). Discussions of recent advances and current problems. Offered in alternate years.

ZOOL 642. *Seminar in Comparative Animal Physiology.* ★3 (Second Term, 0-2s-0). Selected research topics. Prerequisites: ZOOL 441, 442, or ENT 556, or consent of the Department.

ZOOL 643. *Advanced Comparative Animal Physiology.* ★3 (First Term, 3-0-0). Lectures on recent concepts in osmotic and ionic regulation, thermo-regulation and energy metabolism, photobiology, neuroendocrinology and comparative biochemistry. Prerequisites: ZOOL 441 and 442 or consent of the Department. Offered in alternate years.

ZOOL 656. *Helminthology.* ★6 (0-6L-0). Taxonomy, morphology and ecology of the parasitic helminths. Prerequisite: ZOOL 452 or consent of the Department.

ZOOL 663. *Seminar in Population Ecology.* ★3 (Second Term, 0-3s-0). Prerequisite: ZOOL 463 or consent of the Department. Credit for this course may be obtained more than once.

Faculty of Graduate Studies and Research

201 INTRODUCTORY

201.1 Officers of the Faculty

Dean
J. FORSTER, Ph.D.

Associate Deans
W. D. GAINER, Ph.D.
S. B. WOODS, Ph.D.

Graduate Registrar
H. R. HAWES, B.Sc.

Research Grants Officer
G. A. HOLMES, B.Com.

201.2 Council of the Faculty

The Council of the Faculty of Graduate Studies and Research is composed of the officers listed above plus other people appointed to it by General Faculties Council on the recommendation of the Dean of the Faculty.

President and Vice-Chancellor
M. HOROWITZ, Ed.D.

Professors
R. F. ANDERSON, Ph.D., English
T. AOKI, Ph.D., Secondary Education
H. BAADSGARD, Ph.D., Geology
D. BADIR, M.Sc., Home Economics
W. J. BAKER, Ph.D., Linguistics
R. T. BERG, Ph.D., Animal Science
F. D. BLACKLEY, Ph.D., History
J. S. COLTER, Ph.D., Biochemistry
D. A. COOK, D.Phil. Pharmacology
R. T. COUTTS, Ph.D., D.Sc., Pharmacy
R. J. CRAWFORD, Ph.D., Chemistry
J. FERRATE, Lic., Comparative Literature
D. L. FLOCK, Ph.D., Mineral Engineering
R. G. GLASSFORD, Ph.D., Physical Education
P. J. R. HARDING, M.A.Sc., Electrical Engineering
J. A. HARGREAVES, M.Ch.D., A.M., Dentistry
C. B. HAZLETT, Ph.D., Health Services Administration
C. HIRUKI, Ph.D., Plant Science
H. JACKSON, Ph.D., Food Science
J. S. KENNEDY, Ph.D., Mechanical Engineering
L. L. KENNEDY, Ph.D., Botany
W. J. KURMEY, A.M.(L.S.), Library Science
A. T. LAU, Ph.D., Mathematics
M. L. LEROHL, Ph.D., Rural Economy
G. MARAHRENS, Ph.D., Germanic Languages
J. H. MASLIYAH, Ph.D., Chemical Engineering
K. D. McFADDEN, Ph.D., Anatomy
H. J. McPHERSON, Ph.D., Geography
P. A. McFETRIDGE, Ph.D., Elementary Education
J. H. McTEAGUE, Ph.D., Drama
P. J. MILLER, Ph.D., Educational Foundations
G. D. MOLNAR, M.D., Ph.D., Medicine
D. W. MURRAY, Ph.D., Civil Engineering
J. S. NELSON, Ph.D., Zoology
T. R. OVERTON, Ph.D., Biomedical Engineering and Applied Science
B. L. ROCHET, Ph.D., Romance Languages
D. D. SAWATZKY, Ph.D., Educational Psychology
R. E. SCHNECK, Ph.D., Business Administration and Commerce
J. E. SEGER, Ph.D., Educational Administration
B. T. STEPHANSON, M.S., Agricultural Engineering
S. M. STINSON, Ed.D., Nursing
H. D. TICHENOR, Ed.D., Industrial and Vocational Education
T. G. WEGMANN, Ph.D., Immunology
J. R. WILSON, Ph.D., Classics
E. N. YATES, AOCA, Art and Design

Associate Professors
R. L. BUSCH, Ph.D., East European Studies
B. P. DANCIK, Ph.D., Forest Science
S. DASGUPTA, Ph.D., Computing Science
A. S. FRENCH, Ph.D., Physiology
C. G. HICKEY, Ph.D., Anthropology
M. J. HODGSON, Ph.D., Geography
D. P. JONES, M.A., Law
J. A. KERNAHAN, Ph.D., Physics
S. KUMAR, Ph.D., Physical Therapy
S. D. LEWIS, Ph.D., Economics
W. B. McGILL, Ph.D., Soil Science
A. S. A. MOHSEN, Ph.D., Community Development
T. M. S. PRIESTLY, Ph.D., Slavic Languages
M. ROEDER, Ph.D., Music
J. C. RUSSELL, Ph.D., Surgery
R. A. SILVERMAN, Ph.D., Sociology
C. STROBECK, Ph.D., Genetics

Assistant Professors
B. K. MITCHELL, Ph.D., Entomology
W. D. SHARP, B.A., Philosophy
A. TUPPER, M.A., Political Science
G. WELLS, Ph.D., Psychology

Registrar of the University
W. A. BLANCHARD, Ph.D.

Administrator of Student Awards
L. HENDERSON, B.A.

Graduate Students' Association
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B. MAHADOO, Comparative Literature
P. MALCOLM, Romance Languages
R. OLSON, Geography
C. PARKER, Romance Languages
H. THIESSEN, Educational Administration
D. WASARAB, Pharmacy
P. WHITELEY, Elementary Education
P. WILSON, Computing Science

201.3 General Information

Graduate work has been offered at The University of Alberta since its inception in 1908. During recent years the numbers of graduate students have increased rapidly, particularly in the programs leading to doctoral degrees. The present organization of the Faculty with a Dean was adopted in 1957.

The degrees offered by the Faculty are the Master of Arts, Master of Agriculture, Master of Business Administration, Master of Education, Master of Engineering, Master of Fine Arts, Master of Health Services Administration, English, Master of Laws, Master of Library Science, Master of Music, Master of Nursing, Master of Pharmacy, Master of Science, Master of Visual Arts, Doctor of Music, Doctor of Education, and Doctor of Philosophy. Postgraduate Diplomas are offered in Health Services Administration, English, Exploration Geology, Law and Education Administration. The purpose of the postgraduate diploma program is to provide an opportunity for persons who are not able to undertake a graduate degree program to take a recognized package of courses with a view toward increasing their mastery of a specialized area. In 1980 the degrees awarded included one hundred and fifty-seven Ph.D., seventy-two M.A., one hundred and thirty-four M.Sc., six LL.M., one hundred and sixteen M.Ed., fifty-six M.B.A., fourteen M.Eng., five M.V.A., seven M.Mus., nineteen M.H.S.A., one M.Ag., five M.F.A. and twenty-seven M.L.S., four M.N., and two Postgraduate Diplomas in Health Services Administration. There were 2,547 students registered in the faculty in 1980-81.

General regulations, applicable to all graduate students, are set out in § 202, below. Special regulations, applicable to those in a particular degree program, are set out in § 203, below. Further inquiries should be directed to the Dean, Faculty of Graduate Studies and Research, 2-8 University Hall, University of Alberta, Edmonton, Alberta, T6G 2J9.

202 GENERAL REGULATIONS

202.1 Classification of Graduate Students

Graduate students at The University of Alberta are classified in one of the following seven categories:

(1) *Qualifying graduate student.* A student who holds a three year bachelor's degree from The University of Alberta, or a similar qualification from some other institution, may be admitted as a qualifying graduate student. A graduate of a four-year program entering a completely new field may also be admitted as a qualifying graduate student. On satisfactorily completing a qualifying year in the department, a student may be reclassified as a probationary graduate student, a candidate for a master's degree, or as a provisional candidate for a doctor's degree.

(2) *Probationary graduate student.* Such a student is one whose academic record is either (i) difficult to assess, as in the case of some foreign students, or (ii) below the standard normally required. After the completion of one academic year, probationary graduate students who have proved their competence to the satisfaction of their department and the Faculty may be accepted as a candidate for a master's degree or a provisional candidate for a doctor's degree. If accepted, then on the recommendation of the department, they may have courses completed during their probationary year credited towards the requirements for a degree. Each such application will be considered on its merits.

(3) *Candidate for a master's degree (Category A).* Such a student is one who is a graduate of a 4-year degree program continuing in the same field (equivalent of an honors degree or degree with specialization of The University of Alberta). (See § 15.2.10).

(4) *Candidate for a master's degree (Category B).* Such a student is one who is a graduate of a 4-year degree program (beyond senior matriculation), specializing for the first time but not requiring a qualifying year. (See § 15.2.10).

(5) *Provisional candidate for a doctor's degree.* All Ph.D., combined M.D.-Ph.D., and Ed.D. students are first admitted as provisional candidates, and reclassified as candidates only when they have met certain requirements outlined in the special regulations for the relevant degree (see § 203, below).

(6) *Candidate for a doctor's degree.*

(7) *Special graduate student.* Such a student is one who is in every respect eligible for admission to the Faculty and who, though not registered in a degree program at this University, takes one or more *graduate* courses, with the permission of the department concerned.

(8) *Exchange graduate student* — a bona fide student of another university or college who has been permitted to take one or more courses for transfer of credit to his/her own institution which has agreed in advance to such an arrangement.

(9) *Candidate for a Postgraduate Diploma.* Such a student must meet the general admission requirements of the Faculty (§ 202). This specialized program is designed for persons who have had previous work experience and may normally be completed in one academic year of full-time study.

202.2 Admission

202.2.1 ADMISSION REQUIREMENTS

The requirements for admission as a graduate student are:

(1) A baccalaureate degree, with a grade point average of at least 6.0 in the work of the last two undergraduate years at The University of Alberta, or an equivalent qualification from another institution; and

(2) A statement from the chairman of the department concerned to the effect that the applicant is, in all respects, acceptable to the department. A special graduate student or an exchange graduate student, however, not being a candidate for a degree or post-graduate diploma, does not require departmental recommendation.

(3) All *non-Canadians* for whom English is not the major language (a) first *must* write and pass satisfactorily either the Michigan English Language Examination (The Director, Testing and Certification Division, English Language Institute, The University of Michigan, Ann Arbor, Michigan 48104, U.S.A.) or the Test of English as a Foreign Language (TOEFL, Educational Testing Service, Princeton, New Jersey 08540, U.S.A.) before formal admission can be given; and (b) in addition, if formally admitted, must arrive on campus and write, *one week before registration,* an English Language Examination set and administered by The University of Alberta. Students whose performance is unsatisfactory in this English Examination will be allowed to continue their graduate work, but may be required to take English language instruction as part of their regular program.

202.2.2 APPLICATION FOR ADMISSION

Application for admission to the Faculty must be submitted on forms supplied by the Dean. No assurance can be given that applications received after July 15 (for First Term), November 15 (for Second Term) Winter Session; March 1 (for Spring Session) or April 1 (for the Summer Session) can be processed in time to permit registration in that session. A graduate of another university must arrange with the Registrar of that institution to forward two transcripts of his/her academic record to the Dean prior to these dates. The Dean may require the applicant to furnish an official description of the content of the courses listed on the transcripts.

202.2.3 REFUSAL OF ADMISSION

Notwithstanding the Admission Requirements referred to above (§ 202.2.1), The University of Alberta may at its discretion refuse admission to any applicant.

202.3 Registration

202.3.1 CHANGES OF REGISTRATION

Deletion of courses, changes from "credit" to "audit", or changes from "audit" to "credit", may be made only on recommendation of the department in which the student is taking the graduate degree.

Such changes of registration, first approved by the Department Chairman, must be received by the Faculty of Graduate Studies and Research no later than six weeks prior to the date of the final lecture in the course(s) involved: October 20 for First Term courses, February 16 for Second Term and full-session courses. *No credit will be given for any course unless it is included on the program form or covered by an official change of registration.*

Only in special cases supported by the department, and approved by the Faculty of Graduate Studies and Research will a student be allowed to add a First Term or a full-session course to the program after September 19. The deadline date for the addition of new Second Term courses is January 29.

NOTE: Individual departments may require an earlier deadline date for changes in course registration.

202.3.2 MAINTENANCE OF REGISTRATION

Every student on a graduate degree program must register once a year in a full session in order to keep the program active. This registration entitles the student to the use of University facilities and to assistance from his/her supervisor for a twelve month period. Registration during the final year of the program permits the student to graduate at either of the two following Convocations.

The procedure for re-registration is the same as for initial registration, and students must obtain a program form from their department and present it at registration even if they are registering for thesis only.

Students who fail to maintain continuous registration will be considered to have withdrawn from their program. If they wish to resume work on the program, they must apply for re-admission to the Faculty of Graduate Studies and Research and have their program re-assessed in terms of the regulations in force at the time of re-application. If they are recommended for re-admission, a re-admission fee of $60.00 will be charged in addition to the fees assessed in the regular manner.

202.3.3 MAY-AUGUST SUMMER PERIOD

Graduate students who are working full-time on their graduate program during part or all of the period from May to September are encouraged to record their presence on campus at their departmental office. Those holding University awards during this period *must* so record their presence. Residence credit may be given for this period if the student has signed the record.

202.3.4 CANCELLATION OF REGISTRATION

A student who wishes to withdraw from the University should complete "Notice of Withdrawal" forms which must then be submitted to the Dean for approval. A student who withdraws without completing such forms will not be eligible for any refund of fees, nor for exemption from fees in the event that they have not been paid.

A fee adjustment will be made and refunds will be authorized in accordance with the table published in § 15.2.5. The date used for the purpose of calculating the refund is that on which the withdrawal is approved by the Dean.

202.4 Academic Standings

Except in a qualifying year, the pass mark in *any* course taken for credit towards an advanced degree is a grade of 6. Grades of 5 may be accepted in two single-term courses or one full-session course provided a minimum average of 6.0 is acquired at the time

of completion of work for the degree. In this connection the student should keep in mind that courses are weighted differently. Thus a grade of 7 in a session or term course does not necessarily bring one's average up to 6.0 if a grade of 5 was received in another course which carried a greater weight. In a qualifying year, a grade of 4 or 5 may be accepted in an individual course, provided that the grade point average for the year's work is at least 6.0. (Note: The above are *minimum grades* which the Faculty will accept. Individual departments may require higher grades than these.) A grade of 4 obtained by Probationary, Special, or Exchange, Graduate Students will be recorded as a failure.

Graduate students are not permitted to take supplemental examinations. If, after consulting the department or the committee concerned, the Faculty decides that a graduate student is not making satisfactory progress in either course work or research, the student may be required to withdraw.

202.5 Thesis Regulations

In graduate programs in which a thesis is required the candidate shall prepare at least three copies of the thesis. Additional copies may be required by individual departments. For example, all education departments require an additional bound copy for the Education Library.

Three copies of the thesis must be presented to and approved by the Faculty of Graduate Studies and Research, before they are bound.

A booklet entitled "Regulations and Guide for the Preparation of Theses" is available from the Faculty of Graduate Studies and Research.

STUDENTS SHOULD NOT USE THESES PREPARED BEFORE 1976 AS EXAMPLES OF FORMAT.

It is the responsibility of the student and the supervisor to be familiar with all regulations of the Faculty of Graduate Studies and Research with respect to theses, and to any specific requirement of the student's department.

In any case of uncertainty about thesis format, students are encouraged to consult the Faculty office before final typing.

202.6 Oral Examination and Convocation

Unless otherwise specified, each candidate must pass a final oral examination following the submission of the thesis to the department. *The finished thesis must be submitted to the examining committee at least two weeks before the oral examination.*

In order to obtain the degree at the earliest Convocation following the completion of the thesis, the student must have submitted the unbound copies of the thesis to the Faculty Office on or before a date set by the Faculty to allow enough time for the student's name to appear in the Convocation program. The schedule of deadline dates appears in the Academic Schedule or is available from the Faculty Office.

202.7 Time Limit

To be recommended for a degree of Doctor of Philosophy or Ed.D. a candidate must have completed all the requirements within six years of the time he/she is first registered as a probationary graduate student or provisional candidate in the Ph.D. or Ed.D. programs.

To be recommended for a Master's degree, a candidate must have completed all the requirements within four years of the time he/she is first registered as a probationary graduate student or candidate in the Master's program.

202.8 Appeals and Grievances

Student grievances of an academic nature sometimes arise. If this occurs, students in the Faculty of Graduate Studies and Research are advised to first contact the instructor concerned from whom, in most cases, satisfactory explanations will be obtained. If the matter is not resolved, students are advised to see the Department Chairman and the Dean of the Faculty of Graduate Studies and Research, in that order.

For further information regarding Appeals Procedures at the Faculty level the student should seek the advice of the Dean.

For further information related to Appeals and Grievances, students are directed to § 16.7 of the University Regulations and Information for Students Calendar.

203 DEGREE REGULATIONS

203.1 Master's Degrees

203.1.1 COMMON REGULATIONS

Except as noted in § 203.1.2 below, the following regulations apply to all master's degree programs.

(1) A graduate student registered in a program for a master's degree must spend a minimum of two terms in full-time attendance at the University either as a Candidate for the Master's Degree or as a Probationary Graduate Student. An alternative proposal for meeting this residence requirement may be considered if recommended by the department concerned.

NOTE: Some departments may require that a graduate student be in full-time attendance for specified terms.

(2) A candidate entering the Faculty from a four-year specialized program and continuing work in the same field is normally required to complete the equivalent of one calendar year's work. Other candidates are normally required to complete the equivalent of two years' work, the first year as a qualifying student. Details are determined by the department concerned.

(3) Considerable variation is permitted in the balance between the research and the courses required for the degree. All candidates must include some course work in the program, and proposals involving research work equivalent to less than two full courses require Faculty approval.

A number of Departments (Agricultural Engineering, Animal Science, Business Administration and Commerce, Chemical Engineering, Civil Engineering, Community Development, Computing Science, Economics, Educational Administration, Educational Foundations, Electrical Engineering, Elementary Education, Food Science, Germanic Languages, Health Services Administration, Industrial and Vocational Education, Library Science, Mathematics, Mechanical Engineering, Mineral Engineering, Physical Education, Romance Languages, Rural Economy, Secondary Education, Sociology and Soil Science) offer a master's degree by a non-thesis route. In such programs the emphasis is on course work, supplemented by a special study. Details may be obtained from the Departments concerned.

(4) From the commencement of the Master's program each student shall have a supervisor/advisor, whether or not the student is following a thesis or non-thesis route.

(5) Only in special circumstances, and with the approval of the department in which the graduate work is being done, will extramural courses be accepted for credit.

(6) The results of research must be submitted in the form of a thesis conforming to the Faculty regulations.

(7) An examining committee of at least three faculty members, one from a department other than that in which the student is registered, must be approved by the Faculty. The committee will review the thesis and conduct an oral examination designed to test the candidate's knowledge of the thesis subject and of related fields. Persons other than the examiners may attend with the approval of the Dean or the chairman of the committee.

(8) All students in a non-thesis master's degree program must have a minimum of two evaluators/supervisors, at least one of whom is from their department. Supervisors are recommended for approval by the department to the Dean of Graduate Studies. These evaluators are responsible for maintenance of Faculty and departmental standards for the project. A typed report of the project or some other finished product is made available and kept on file in the department.

203.1.2 SPECIAL REGULATIONS FOR PARTICULAR DEGREES

(1) For the *M.A. in Community Development,* in addition to the above requirements, a four-month field internship is required. (See § 204.17, below.)

(2) The *M.Ag.* degree differs from the M.Sc. in Agriculture in the following particulars:

(i) the applicant is normally expected to have completed three years of satisfactory professional experience;
(ii) the minimum residence requirement is one term;
(iii) the degree program consists of the equivalent of five full-year graduate level courses plus a project equivalent in weight to at least a one-term course.

(3) The *M.Eng.* differs from the M.Sc. in Engineering in the following particulars:

(i) the minimum residence requirement is one term;
(ii) The degree program consists of the equivalent of five full courses, and a project instead of a thesis.

(4) In the program for the *M.F.A. in Drama* the thesis will be replaced by the presentation of a creative project and a related historical or critical essay. (See § 204.22, below.)

(5) In the program for the *M.Mus. in Applied Music,* the thesis will be replaced by the presentation of a special project and a performance requirement. (See § 204.54, below.)

(6) Programs leading to the notation of specialization in East European and Soviet Studies require the joint approval of the Division of East European Studies and the participating department. Signatures for the Division and the Department are required on the recommendation of admission, the study program, the notice of oral examination, and the report of the final examining committee.

(7) *M.Eng. in Welding Engineering:*

(i) Depending on the student's field of study for his/her B.Sc. degree, he/she will be assigned to either the Department of Civil Engineering or the Department of Mineral Engineering as his/her home department.
(ii) A maximum of 50% (5 one-term courses) of the total course load for the M.Eng. degree can be taken in the student's home department. Similarly, not less than 30% of the course load must be taken within such department.
(iii) All home department courses must be on the 600 level.
(iv) Dependent on individual approval, a student may be permitted to take a maximum of two appropriate 400 - or 500 - level undergraduate courses for credit towards his/her degree. Such courses cannot be part of his/her home department's undergraduate core curriculum.
(v) The work for the project may be conducted within the University environment or outside in industry, but approval, control, and supervision will remain with the student's faculty supervisor.
(vi) Certain courses must be taken by all students in

the program, regardless of educational specialty. Consult the current course listing for details.

(vii) Degree designation will be Master of Engineering in (home department field), e.g., Master of Engineering in Civil Engineering (Welding Engineering).

(8) *M.Eng. in Oil Sands Engineering*

(i) Depending on the student's field of study for his/her Bachelor's degree, he/she will be assigned to one of the Departments of Engineering as his/her home departments.

(ii) The degree program consists of ten single-term courses and a project.

(iii) Six of the single-term courses must be taken from a list of core courses. Consult the current course listing for details.

(iv) The work for the project may be conducted within the University environment or outside in industry, but approval, control, and supervision will remain with the student's faculty supervisor.

(v) The degree designation will be Master of Engineering in (home department field), e.g., Master of Engineering in Civil Engineering (Oil Sands).

(9) *M.B.A.—LL.B. Joint Program*

The Faculty of Business Administration and Commerce and the Faculty of Law offer a program of joint study which permits students to earn both the M.B.A. and LL.B. degree in four years.

Acceptance by the Faculty of Graduate Studies and Research (for admission into the M.B.A. program) and by the Faculty of Law, separately, is a prerequisite to admission into the M.B.A.—LL.B. program; admission into each faculty will be determined by the same selection process and criteria as for other students. In addition, each student must be admitted into the combined program. Admission into the combined program will be determined by a Selection Committee composed of representatives of the Faculty of Law and of the Faculty of Business Administration and Commerce. Since this is a special program, particular attention in the selection process will be given to:

i. a student's past academic achievement; and

ii. maturity, interest, and a rationale of how such a combined program will enhance a student's career and professional skills.

Each student must apply separately to the Faculty of Law and to the Faculty of Graduate Studies and Research (for admission into the M.B.A. program).

In addition, each student must apply to the combined program by completing an additional M.B.A.—LL.B. application form available in the Faculty of Law or the Faculty of Business Administration and Commerce.

In addition to new entrants, students in the first year of either the regular M.B.A. program or the Faculty of Law are eligible to apply for the joint program.

203.2 The Degree of Ph.D.

(1) Students may be admitted as a provisional candidate for the degree of Doctor of Philosophy if they hold a bachelor's or a master's degree, or equivalent, from an approved university. Admission is contingent upon recommendation by a department and upon the availability of suitable supervision, suitable courses of study and library, laboratory, and other facilities. Students will remain as provisional candidates until they have successfully completed their candidacy examination (see Para. 6 below).

(2) The essential requirement for the doctorate is the planning and carrying out of research of high quality leading to an advance in knowledge in the candidate's field of study.

(3) The time necessary to complete the requirements for the doctorate depends upon the student's progress. For a student with a bachelor's degree the minimum requirement is three academic years of study and research, of which two academic years must be in residence at The University of Alberta. For a student with a master's degree the minimum requirement is two academic years of study and research in residence at The University of Alberta. An alternative method of meeting the residence requirement may be considered on recommendation to the Faculty of Graduate Studies and Research by the department concerned.

(4) The student's program shall be under the direction of a supervisory committee of not fewer than the three faculty members appointed by the Faculty of Graduate Studies and Research. The chairman of the committee shall be the faculty member under whose supervision the student is carrying out the research. Where appropriate, one or more members of the committee may be chosen from a department other than that in which the research is being carried out. The committee shall recommend to the Faculty of Graduate Studies and Research a program of research. The same committee shall arrange for the necessary examinations and for adjudication of the thesis.

(5) A department may require a student to demonstrate a knowledge of one or more languages in addition to English. If a department has such a requirement the student must satisfy it before being allowed to take the candidacy examination.

(6) At least six months before taking the final examination (on the thesis), the student shall pass a candidacy examination in subjects relevant to the general field of research. At the candidacy examination, the student must demonstrate to the satisfaction of the examining committee that he/she possess (a) an adequate knowledge of the discipline and of the subject matter relevant to the thesis, and (b) the ability to pursue and complete original research at an advanced level. At most, only minor attention should be given to the work done on the thesis project. As well, the student may be required by the department to pass comprehensive examinations prior to the actual candidacy examination. Normally an oral examination is required and will be held when most, if not all, of the course work is completed and the thesis project started or well defined.

The examination shall be under the direction of the supervisory committee to which two other members of the teaching staff have been added. At least one member of the examining committee shall be a person from a department or discipline other than that in which the research is being carried out. Persons other than the examiners may attend only by agreement of the Dean of the Faculty of Graduate Studies and Research or the chairman of the committee. Visitors may not participate in the committee's discussion concerning decision on the student's performance.

(7) The results of the candidate's research shall be presented in a thesis satisfying the general requirements of the Faculty of Graduate Studies and Research. The material must be of sufficient merit to meet the standards of reputable scholarly publications.

(8) The thesis shall be examined by an examining committee consisting of the supervisory committee and at least two other examiners. One member of the exam-

ining committee shall be from a department or discipline other than that in which the student is working, and one member shall be an external examiner who is a recognized authority in the special field of research and should have had no previous association with the candidate.

(9) A final oral examination, based largely on the thesis, shall be conducted by the examining committee. Members of the staff of the student's major department as well as members of the Council of the Faculty of Graduate Studies and Research, or their alternates, have the right to attend but should so notify the chairman of the examining committee. Other persons may attend with special permission of the Dean of the Faculty of Graduate Studies and Research or the Chairman of the examining committee.

Except for the Dean (or Associate Dean) of the Faculty of Graduate Studies and Research, who may participate fully in the examination, persons who are not members of the examining committee: (a) may participate in the questioning only by permission of the Chairman of the Committee, and (b) are not permitted to participate in the discussion of the student's performance and must withdraw before such discussion commences.

203.3 Combined Program for the Degrees of M.D. and Ph.D.

Highly qualified students desiring to pursue a career of teaching and research in either basic medical science or in clinical medicine may enrol in a program of six to seven years' duration leading to the acquisition of both an M.D. and a Ph.D. degree.

A student may, after completion of two years of a medical program, withdraw from that program and apply for admission to the Faculty of Graduate Studies and Research. If acceptable to the appropriate basic science department and to the Faculty of Graduate Studies and Research, the student would embark upon a program leading to the Ph.D. degree. The time required for the completion of the requirements for the Ph.D. degree would depend upon the previous training of the applicant, and would be normally three years in the case of a student who had entered the Faculty of Medicine holding a B.Sc. degree, and four years in the case of a student who entered the Faculty of Medicine from a two-year premedical program. Upon completion of the Ph.D. program, the student could re-enter the Faculty of Medicine and complete the requirements for the M.D. degree.

Students interested in such a program may obtain further information from the chairman of the appropriate department.

203.4 The Degree of Ed.D.

The degree of Doctor of Education, attests proficiency in a program of graduate study in which the emphasis is upon preparation for competent professional performance. The general regulations with respect to admission, residence requirements, candidacy examinations and final oral examinations, based largely on theses, for the Ed.D. degree are the same as those listed for the Ph.D. degree with the following exceptions:

(1) Several years of successful teaching and an M.Ed. degree or its equivalent are prerequisites for admission.

(2) A reading knowledge of French is required. In special circumstances another language may be substituted.

(3) The program emphasizes breadth in educational theory, practice, and research rather than intensive specialization in a particular area.

(4) The student's program may make provision for supervised field experience.

204 GRADUATE PROGRAMS AND COURSES

204.1 General Information

A brief description of each program offered under the auspices of the Faculty of Graduate Studies and Research is given in alphabetical order in the following sections. Prospective applicants should note particularly the admission requirements, the fields in which research may be carried out, and the requirements for each program in addition to the general requirements of the Faculty of Graduate Studies and Research.

Both graduate courses and undergraduate courses which may be taken for credit in a graduate program are listed following the description of the program.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in their registration forms.

Following the title of the course is (in most instances) the symbol ★ standing for "course weight" and a number indicating the weight of the course as used in computing grade-point averages. The weights (or course units) for the Faculty of Engineering are based on the number of hours, lectures, seminars and laboratories and are listed following the symbol □. A normal full-session course is weighted 6. Single-term courses are weighted 3. Some courses involving research may vary in weight according to the length and difficulty of the project.

The next three figures, enclosed in parentheses, indicate the hours of instruction required by the course in a week. The format is as follows: the first position indicates lecture hours; the second position indicates seminar hours (s), demonstration (d), clinic (c), or lecture-lab (L); and the third position indicates laboratory hours. If the course is a single-term course, the term in which it is offered is mentioned.

THE APPEARANCE OF A COURSE DESCRIPTION IN THE FOLLOWING LISTS DOES NOT CONSTITUTE ANY GUARANTEE THAT THE COURSE WILL ACTUALLY BE OFFERED IN THE FORTHCOMING SESSION. INFORMATION AS TO WHICH COURSES WILL BE OFFERED, THE NAMES OF THE INSTRUCTORS, AND ALL FURTHER DETAILS MUST BE SOUGHT FROM THE DEPARTMENT CONCERNED.

204.2 Agricultural Engineering

204.2.1 THE DEGREE OF M.AG., M.ENG. AND M.SC.

(1) The Department of Agricultural Engineering offers programs leading to the degrees of Master of Agriculture, Master of Engineering and Master of Science.

(2) Candidates with undergraduate training in Engineering Agrology can enrol in either the M.Ag. or M.Sc. programs. Candidates with a degree in agricultural engineering or its engineering equivalent can enrol in either the M.Eng. or M.Sc. programs.

(3) Candidates with undergraduate training in forestry can enrol in an M.Sc. program in either of the following specializations: (a) Forest Operations or (b) Wood Utilization.

(4) Required courses depend on the area of specialization and the undergraduate background of the student. Master of Agriculture and Master of Engineering programs consist of ten single-term courses or equivalent plus a project. Applicants will normally be expected to have at least three years of post B.Sc. experience. The minimum residence requirement would be one term and the time limit for completion of the program would be four years. Master of Science programs normally consist of eight single-term courses or equivalent plus a thesis. Agricultural Engineering 600 is a requirement for all graduate students.

(5) Research work leading to the preparation of a thesis for the M.Sc. degree is undertaken within the Department of Agricultural Engineering. Graduate students who select some phase of irrigation for investigation may conduct part of their research at the Canada Agriculture Research Station, Lethbridge, Alberta, or other approved off-campus research, educational or technical institution.

(6) Funds are available for a limited number of graduate students to be engaged by the Department as teaching and research assistants. Financial assistance is also available for graduate students through research grants to staff in specific areas.

204.2.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

AG EN 411. *Irrigation Principles and Practices.* ★3 (First Term, 3-0-0). Soil-water-plant relationships; water requirements; efficiency of water use; irrigation scheduling; planning and evaluation of irrigation systems. Prerequisite: SOILS 310 or equivalent. Offered jointly with Department of Soil Science.

AG EN 413. *Irrigation and Drainage Engineering.* ★3 (Second Term, 3-0-3). Irrigation and drainage principles; planning and design of irrigation and drainage systems. Prerequisite: CIV E 430.

AG EN 420. *Analysis of Agricultural Systems.* ★3 (First Term, 3-0-3). The application of mathematical programming methods to problems in agricultural systems. Prerequisites: MATH 243, or MATH 312, or AG EC 316. Not open to students with credit in FOREN 420.

AG EN 421. *Simulation Methods in Agricultural Engineering.* ★3 (Second Term, 3-0-3). Use of analogue and digital computers to simulate agricultural processes (e.g., harvesting, fertilizing, seeding, ventilating, irrigating). Continuous and discrete simulation models are developed in group projects. Prerequisite: Introductory courses in computing science and calculus. Not open to students with credit in FOREN 421.

AG EN 453. *Power Units.* ★3 (First Term, 3-0-3). Energy conservation, power transmission, soil vehicle mechanics, hydraulic systems, tractor performance and evaluation, tractor dynamics. Prerequisites: CH E 324, CIV E 430, MEC E 350

AG EN 454. *Agricultural Machinery.* ★3 (Second Term, 3-0-3). The course uses the wedge theory and the Mohr-Coulomb failure criteria as a basis for a simple tillage theory. Various tillage tools are examined as well as implement and tractor chassis mechanics. An introduction to harvesting processes is made. Particle dynamics and mechanics of raking and cutting are developed. Harvesting systems are noted. Prerequisite: MEC E 350, CIV E 480.

AG EN 456. *Post-Harvest Technology.* ★3 (First Term, 3-0-3). Forage conditioning, fractionation, wafering, preservation, and silage, grain and forage dehydration, feeding and transport equipment, storage regimes, cleaning, sorting and milling, conveying and metering, process control. Prerequisite: AG EN 301.

FOREN 420. *Analysis of Forest Systems.* ★3 (First Term, 3-0-3). The application of mathematical programming methods to problems in forest systems. Prerequisite: MATH 243 or MATH 312 or AG EC 316. Not open to students with credit in AG EN 420.

FOREN 421. *Simulation Methods in Forest Engineering.* ★3 (Second Term, 3-0-3). Use of analogue and digital computers to simulate forest processes (e.g., harvesting, fire detection, fire suppression). Continuous and discrete simulation models are developed in group projects. Prerequisite: Introductory courses in Computing Science and Calculus. Not open to students with credit in AG EN 421.

204.2.3 GRADUATE COURSES

THES 000. *Thesis.*

AG EN 503. *Instrumentation in Agriculture Engineering.* ★3 (First Term, 3-0-3). A study of the primary sensing elements used in agricultural engineering, their principles of operation and application. Prerequisite: CIV E 360, E E 302, MEC E 350.

AG EN 552. *Advanced Irrigation and Drainage.* ★3 (Second Term, 3-1s-0). Studies of selected topics or special problems in irrigation and drainage. Prerequisite: SOILS 470 or AG EN 313.

AG EN 555. *Data Analysis and Processing.* ★3 (Second Term, 3-0-3). Application of statistical techniques to experiments in agricultural engineering including dimensional analysis and curve fitting techniques. Data computation with graphical output. Prerequisites: CMPUT 351, STAT 241.

AG EN 600. *Agricultural Engineering Seminar.* ★0 (0-1s-0).

AG EN 602. *Selected Topics in Agricultural Mechanization.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0). Application of statistical and mathematical techniques to selected problems in agricultural engineering.

AG EN 603. *Advanced Agricultural Buildings and Environment.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 604. *Advanced Farm Power and Machinery.* ★3 (Second Term, 3-0-0). Selected topics in traction, hydraulic systems, driver comfort and safety. New developments in farm machinery.

AG EN 605. *Project in Agricultural Machinery.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 606. *Advanced Soil and Water Engineering.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0).

AG EN 910. *Non-Thesis Project.* ★3 (variable). Detailed report in the student's major area of interest in an M.Ag. or M.Eng. program.

FOREN 550. *Problems in Forest Engineering.* ★3 (either term, 3-0-0). Directed study in forest engineering. Including forest harvesting, road location and construction. Prerequisite: Consent of instructor.

FOREN 551. *Trends and Problems in Wood Science.* ★3 (either term, 1-2s-0) or ★6 (1-2s-0). Directed study in wood technology and forest products with emphasis on current trends and new developments in wood science and the forest products industry. Prerequisite: Consent of the instructor.

FOREN 650. *Selected Topics in Forest Engineering.* ★3 (either term, 3-0-0).

204.3 Anatomy

204.3.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department offers a program of course work and research leading to the degree of M.Sc. or Ph.D.

(2) The Department has well equipped research laboratories for investigations in the fields of gross anatomy, histology, histochemistry, cytology, neuroanatomy and embryology.

(3) Programs leading to the degree of M.Sc. are open to medical and dental graduates and to science graduates of a four-year program. Applicants for the Ph.D. program must be medical or dental graduates or hold a master's degree.

(4) The M.Sc. program usually covers two years, with a minimum of three years for the Ph.D.

(5) Information regarding assistantships and other forms of financial assistance will be supplied upon request.

(6) Address all inquiries to the Chairman of the Department.

204.3.2 GRADUATE COURSES

THES 000. *Thesis.*

ANAT 601. *Histology and Cytology.* ★6 (2-0-4).

ANAT 602. *Developmental Anatomy.* ★3 (First Term, 2-0-4).

ANAT 604. *Advanced Neuroanatomy.* ★6 (2-0-2).

ANAT 605. *Gross Anatomy.* ★6 (2-0-4). A detailed survey of regional anatomy for students who previously have completed a course of dissection.

204.4 Animal Science

204.4.1 THE DEGREES OF M.AG., M.SC., AND PH.D.

(1) Graduate study leading to the degrees of Master of Science or Doctor of Philosophy may be undertaken in biochemistry, genetics, nutrition, or physiology in either the Animal Science or the Poultry Science division of the Department of Animal Science. Domestic or non-domestic species may be studied. Well equipped laboratories are maintained for research purposes.

(2) The Department offers the M.Ag. program (see § 203.1.2). Details of the program should be discussed with the Chairman of the Department.

(3) Normally M.Sc. students are required to complete two of the Animal Science graduate courses listed below plus at least two approved courses selected from the following areas; Biochemistry, Biometrics, Chemistry, Genetics, Mathematics, Physiology and Zoology.

(4) The time required to complete a M.Sc. program varies according to the undergraduate training of the student and the nature of the research undertaken. Normally two academic years of course work and research plus one summer of research, or one academic year and two summers, are needed.

(5) Courses for Ph.D. students are selected according to the background and interests of the candidates.

(6) Information regarding assistantships and other forms of financial assistance currently available to graduate students will be supplied upon request; address inquiries to the Chairman of the Department.

204.4.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

AN SC 460. *Fundamentals of Nutrition.* ★3 (First Term, 3-0-0).

AN SC 461. *Ruminant Nutrition.* ★3 (Second Term, 3-0-3).

AN SC 463. *Applied Monogastric Nutrition.* ★3 (Second Term, 3-0-3).

AN SC 464. *Nutritional Experimentation.* ★3 (First Term, 2-0-3).

AN SC 473. *Production and Management of Dairy Cattle, Sheep and Swine.* ★3 (Second Term, 3-0-0).

AN SC 477. *Beef Cattle Production and Management.* ★3 (Second Term, 3-0-0).

AN SC 484. *Animal Population Genetics.* ★3 (First Term, 1-2s-0).

AN SC 485. *Animal Improvement.* ★3 (Second Term, 3-0-2).

AN SC 491. *Animal Biochemistry.* ★3 (Second Term, 3-0-3).

AN SC 493. *Physiological Chemistry of Muscle and Meat.* ★3 (Second Term, 3-0-0).

POULT 453. *Applied Poultry Genetics.* ★3 (Second Term, 3-0-3).

POULT 459. *Processing Poultry and Poultry Products.* ★3 (First Term, 3-0-0).

POULT 462. *Poultry Diseases and Hygiene.* ★3 (First Term, 3-0-0).

204.4.3 GRADUATE COURSES

THES 000. *Thesis.*

AN SC 501. *Research Project.* Weight according to work done to a maximum of ★6.

AN SC 510. *Ruminant Physiology.* ★3 (First Term, 3-0-3). Selected topics in metabolic endocrinology and environmental physiology of ruminants.

AN SC 550. *Grazing System Dynamics.* ★3 (First Term, 3-0-3). Application of the techniques of systems analysis and computer simulation in research and management of livestock and wildlife production systems.

AN SC 580. *Biometrical Techniques in Animal Science I.* ★3 (First Term, 3-0-3). Application of biometrical techniques to problems in Animal Science. Recommended: STAT 241. Offered in alternate years.

AN SC 583. *Biometrical Techniques in Animal Science II.* ★3 (Second Term, 3-0-3). A continuation of AN SC 580 in the application of biometrical techniques to problems in Animal Science. Recommended: AN SC 580.

AN SC 587. *Biometrical Techniques in Quantitative Animal Genetics.* ★3 (Second Term, 3-0-3).

AN SC 600. *Seminar.* ★3 (0-3s-0). Required each year of all graduate students.

AN SC 614. *Advanced Animal Nutrition.* ★3 (First Term, 3-0-0). Offered in alternate years.

AN SC 616. *Advanced Protein Nutrition.* ★3 (First Term, 3-0-0). Offered in alternate years.

AN SC 621. *Instrumentation for Animal Scientists.* ★3 (Second Term, 3-0-2).

AN SC 900. *Non-Thesis Project.* ★variable (variable).

204.5 Anthropology

204.5.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Anthropology offers the Master of Arts and Doctor of Philosophy degrees within the field of anthropology, including social anthropology, ethnology, archaeology and physical anthropology. Entrance requirements are those of the University.

(2) Requirements for the M.A. degree in addition to those of the University are:

(i) Satisfactory completion of three full graduate level courses in Anthropology, one of which should be outside the major area of a student's research orientation. Five full courses is considered a normal load.

(ii) Demonstrated reading proficiency in one language other than English; normally French.

(iii) Demonstrated proficiency in the handling of any research tools deemed necessary for the M.A. thesis, to the satisfaction of the thesis committee.

(iv) An acceptable M.A. thesis according to Faculty regulations and staff expectations.

(3) Requirements for the Ph.D. degree in addition to those of the University are:

(i) For students entering the program without an M.A. degree in anthropology, satisfactory com-

pletion of the coursework in anthropology required for an M.A. in the Department of Anthropology at The University of Alberta.

(ii) If reading proficiency in French has not previously been demonstrated, it must be demonstrated before the candidacy examination.

(iii) Submission of a satisfactory research proposal which will lead to production of a thesis of publishable quality based on original advanced research and theoretical interpretation.

(4) The Department has a number of teaching, research and service assistantships.

(5) Students contemplating graduate work in Anthropology should direct their inquiries to the Chairman of the Department.

DEADLINE FOR RECEIPT OF COMPLETED APPLICATIONS FOR ADMISSION IS MARCH 31.

204.5.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

ANTHR 404. *Human Biology.* ★6 (3-0-0).
ANTHR 405. *Old World Prehistory I.* ★3 (either term, 3-0-0).
ANTHR 406. *Old World Prehistory II.* ★3 (either term, 3-0-0).
ANTHR 410. *Sex and Status in Comparative Perspective.* ★3 (either term, 3-0-0).
ANTHR 411. *New World Prehistory.* ★6 (3-0-0).
ANTHR 412. *Slavery and Slave Societies.* ★3 (either term, 3-0-0).
ANTHR 413. *Social Structure.* ★6 (3-0-0).
ANTHR 414. *Peasant Society and Culture.* ★3 (either term, 3-0-0).
ANTHR 415. *History of Anthropology.* ★3 (either term, 3-0-0).
ANTHR 418. *Political Anthropology.* ★3 (either term, 3-0-0).
ANTHR 419. *Pastoral Societies.* ★3 (either term, 3-0-0).
ANTHR 420. *Anthropology of Religion.* ★6 (3-0-0).
ANTHR 421. *Revitalization Movements in Anthropological Perspective.* ★3 (either term, 3-0-0).
ANTHR 423. *Ecological Anthropology.* ★3 (either term, 3-0-0).
ANTHR 424. *Economic Anthropology.* ★3 (either term, 3-0-0).
ANTHR 425. *Anthropology of Work and Production.* ★3 (either term, 3-0-0).
ANTHR 426. *Anthropological Perspectives in Ethnomusicology.* ★3 (either term, 3-0-0).
ANTHR 427. *Creative Expression I.* ★3 (either term, 3-0-0).
ANTHR 428. *Creative Expression II.* ★3 (either term, 3-0-0).
ANTHR 431. *Multilingualism.* ★3 (either term, 3-0-0).
ANTHR 433. *Ethnographic Semantics.* ★3 (either term, 3-0-0).
ANTHR 434. *Language Learning in Cultural Context.* ★3 (either term, 3-0-0).
ANTHR 435. *Language Prehistory.* ★3 (either term, 3-0-0).
ANTHR 445. *Circumpolar Prehistory.* ★3 (either term, 3-0-0).
ANTHR 446. *Circumpolar Ethnology.* ★3 (either term, 3-0-0).
ANTHR 447. *Culture and the Individual I.* ★3 (First Term, 3-0-0).
ANTHR 448. *Culture and the Individual II.* ★3 (Second Term, 3-0-0).
ANTHR 460. *Contemporary Anthropological Theory and Method.* ★3 (either term, 3-0-0).
ANTHR 461. *Theory in Social Anthropology.* ★6 (3-0-0).
ANTHR 462. *Culture Change.* ★6 (3-0-0).
ANTHR 463. *The Origins of Food Production.* ★3 (either term, 3-0-0).
ANTHR 465. *The Ethnology of Education and Cultural Change.* ★3 (either term, 3-0-0).
ANTHR 470. *American Indian Linguistics.* ★6 (3-0-0).
ANTHR 471. *Readings in Anthropology I.* ★3 (First Term, 3-0-0).
ANTHR 472. *Readings in Anthropology II.* ★3 (Second Term, 3-0-0).
ANTHR 478. *Advanced Studies in Latin American Indian Communities.* ★3 (either term, 3-0-0).
ANTHR 480. *Method and Theory in Prehistoric Archaeology.* ★6 (3-0-0).
ANTHR 482. *North American Regional Ethnology.* ★6 (3-0-0).
ANTHR 483. *Cree Language and Culture.* ★6 (3-0-0).
ANTHR 484. *Readings in Anthropology.* ★3 (either term, 0-3s-0).
ANTHR 485. *Readings in Social Anthropology.* ★6 (0-3s-0).
ANTHR 486. *Advanced Readings in Anthropology.* ★3 (either term, 0-3s-0).
ANTHR 487. *Readings in Regional Ethnology.* ★6 (0-3s-0).
ANTHR 488. *Field and Laboratory Methods in Paleoenvironmental Studies.* ★3 (First Term, 3-0-3).
ANTHR 489. *Faunal Analysis for Archaeologists.* ★6 (0-3s-3).
ANTHR 490. *Human Osteology for Archaeologists.* ★3 (either term, 0-3s-3). Note: Not open to medical students.
ANTHR 491. *Stone Tools.* ★3 (either term, 3-0-3).
ANTHR 492. *Problems in Primate Behavior.* ★3 (either term, 3-0-0).
ANTHR 494. *Quaternary Environments II.* ★3 (Second Term, 3-0-0).
ANTHR 495. *Archaeological Methods.* ★6 (3-0-3).
ANTHR 496. *Advanced Readings in Anthropology.* ★6 (0-3s-0).
ANTHR 497. *Early Man in the New World.* ★6 (3-0-0).
ANTHR 498. *Paleoenvironmental Studies.* ★3 (either term, 3-0-0).

204.5.3 GRADUATE COURSES

THES 000. *Thesis.*
ANTHR 501. *History of Anthropology.* ★3 (either term, 0-3s-0).
ANTHR 502. *General Scope of Anthropology.* ★6 (0-3s-0).
ANTHR 503. *Anthropology of Conflict.* ★6 (0-3s-0). Restricted to Graduate and Honors students in Anthropology and Sociology except with consent of the Department.
ANTHR 504. *Methods in Ethnology and Social Anthropology.* ★6 (0-3s-3). Restricted to Graduate students and fourth-year Honors students in Anthropology except with consent of the Department.
ANTHR 505. *Field Methods in Ethnology and Social Anthropology.* ★6 (0-3s-0). Note: Restricted to graduate students and fourth-year Honors students in Anthropology except with consent of the Department.
ANTHR 507. *Seminar in Linguistic Anthropology.* ★6 (0-3s-0).
ANTHR 508. *Methods in Linguistic Anthropology.* ★3 (either term, 0-3s-3).
ANTHR 510. *Theory of Culture.* ★6 (0-3s-0). Open to fourth-year Honors or Graduate students in Anthropology, or to others with consent of the Department.
ANTHR 515. *Seminar: The Transmission of Culture.* ★6 (0-3s-0). Restricted to Graduate students in Anthropology, Sociology or Education, except with consent of the Department.
ANTHR 516. *Selected Problems of Modern East Asia.* ★6 (0-3s-0). Restricted to graduate students and fourth-year honors students in Anthropology, except with consent of the Department.
ANTHR 525. *Seminar: Problems in the Anthropology of Art.* ★3 (either term, 0-3s-0).
ANTHR 530. *Comparative Agrarian Societies.* ★6 (0-3s-0).
ANTHR 535. *Anthropology and the Nation-State.* ★6 (0-3s-0). Restricted to Graduate students in Anthropology, Sociology, Political Science, or Economics.
ANTHR 537. *Seminar in Anthropology of Development.* ★6 (0-3s-0). Restricted to Graduate or fourth-year Honors students in Anthropology.
ANTHR 540. *Conference Course in Regional Ethnology.* ★6 (0-3s-0).
ANTHR 541. *Conference Course in Regional Archaeology.* ★6 (0-3s-0).
ANTHR 542. *Individual Research.* ★6 (0-3s-0).
ANTHR 544. *Advanced Readings in Social Anthropology.* ★6 (0-3s-0).
ANTHR 549. *Advanced Readings in Regional Ethnology.* ★6 (0-3s-0).
ANTHR 550. *Topics in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0).
ANTHR 551. *Topics in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0).
ANTHR 552. *Topics in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0).
ANTHR 553. *Topics in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0).
ANTHR 554. *Seminar in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 555. *Seminar in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 556. *Seminar in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 557. *Seminar in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 558. *Contemporary Problems in Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 559. *Contemporary Problems in Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 590. *Advanced Physical Anthropology.* ★6 (0-3s-3).

ANTHR 591. *Advanced Reading in Archaeology.* ★6 (0-3s-0).

ANTHR 592. *Current Problems in the Study of Fossil Hominidae.* ★3 (either term, 0-3s-0).

ANTHR 595. *Seminar in Archaeology.* ★6 (0-3s-3).

ANTHR 598. *Prehistoric Cultural Ecology.* ★6 (0-3s-0).

ANTHR 599. *Seminar in Paleoenvironmental Studies.* ★3 (Second Term, 0-3s-0).

ANTHR 616. *Topics in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 617. *Topics in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 618. *Topics in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 619. *Topics in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 620. *Seminar in Social and Cultural Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 621. *Seminar in Social and Cultural Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 622. *Seminar in Archaeology and/or Physical Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 623. *Seminar in Archaeology and/or Physical Anthropology II.* ★3 (Second Term, 0-3s-0).

ANTHR 624. *Contemporary Problems in Anthropology I.* ★3 (First Term, 0-3s-0).

ANTHR 625. *Contemporary Problems in Anthropology II.* ★3 (Second Term, 0-3s-0).

204.6 *Art and Design*

204.6.1 GENERAL INFORMATION

The Department of Art and Design offers graduate programs leading to the Master of Visual Arts degree in a wide range of studio disciplines. The Department also offers Graduate Programs leading to the Master of Arts degree in History of Art and Design.

Programs leading to the M.V.A. Degree in Studio are designed to provide advanced studies in Industrial Design, Sculpture, Painting, Printmaking and Visual Communication Design.

Programs leading to the M.A. Degree in the History of Art and Design are designed to provide advanced study and research in History of Art and Design with a concentration on the 19th and 20th centuries.

Graduate Assistantships of $2,900 to $3,900 are available to qualified students.

Inquiries should be addressed to the Coordinator of Graduate Studies, Department of Art and Design.

204.6.2 THE DEGREE OF M.V.A.

(1) An applicant must normally hold a Bachelor's degree in Fine Arts (or its equivalent) from a recognized institution.

(2) Applicants will be required to submit visual records or a portfolio of work, and documentation of their previous experience, to the Department before April 1st of the year of application.

(3) Applicants who are accepted will normally require two academic years to complete their program of studies.

(4) Candidates who, in the view of the Department, need to make up prerequisite courses will normally spend one additional year in preparation.

(5) All candidates require credit in ART 630.

(6) Candidates in Fine Arts programs require credit in two studio courses at the 600 level and two History of Art and Design courses chosen from 400 or 500 or 600 level courses with consent of the Department.

(7) Candidates in Design programs require credit in:

(i) either of ART 672 or ART 692 and either of ART 673 or ART 693;

(ii) ART 675 or ART 695 or a History of Art and Design course chosen from a 400, 500, or 600 level course in Aspects of Design in the 19th Century or Aspects of Design in the 20th Century;

(iii) A course chosen from selected courses offered by other departments, or from courses at the 400, 500, or 600 level in the History of Art and Design, or courses in Studio or Design Theory and Technology at the 400 or 500 level in an area other than the student's own division. Consent of Department required.

(8) Course work must be completed before commencement upon the thesis. First Term Studio courses may not be repeated, but Second Term Studio courses may be repeated with the consent of the Department.

(9) After all other program requirements have been satisfactorily met, candidates must make a major presentation of their creative work. Such a presentation will be considered the equivalent of a master's thesis.

(10) The Department of Art and Design reserves the right to select and retain up to two works from the final M.V.A. Thesis Presentation.

204.6.3 THE DEGREE OF M.A. IN THE HISTORY OF ART AND DESIGN

(1) An applicant must normally hold an Honours degree in the History of Art (or its equivalent) from a recognized institution.

(2) Applicants with a bachelor's degree in a discipline other than History of Art will be considered for admission provided that an adequate background in the History of Art can be demonstrated.

(3) Applicants who are accepted will normally require two academic years to complete their program of studies.

(4) Candidates who, in the view of the Department, need to make up prerequisite courses will normally spend a longer period of time to complete their graduate program.

(5) All candidates require credit in ART H 659 and four other approved full course equivalents chosen from the History of Art and Design offerings at the 500 and 600 levels. Candidates are required to demonstrate reading competence in a language other than English — normally French, German or Italian.

(6) To gain permission to enter the second year of the program, candidates must satisfactorily complete at the end of the first academic year,

(a) a translation test in a language other than English, normally French, German or Italian, and

(b) a short-term research project.

(7) After all other program requirements have been satisfactorily met candidates must present and defend a masters thesis.

204.6.4 GRADUATE COURSES IN STUDIO

THES 000. *Thesis.*

ART 612. *Painting: concepts, analysis and criticism.* ★12 (First Term, 0-3s-18).

ART 613. *Painting: development of concepts, analysis and criticism.* ★12 (Second Term, 0-3s-18).

ART 622. *Printmaking: concepts, analysis and criticism.* ★12 (First Term, 0-3s-18).

ART 623. *Printmaking: development of concepts, analysis and criticism.* ★12 (Second Term, 0-3s-18).

ART 630. *Seminar in Related Disciplines.* ★3 (both terms, 0-1s-0).

ART 662. *Sculpture: concepts, analysis and criticism.* ★12 (First Term, 0-3s-18).

ART 663. *Sculpture: development of concepts, analysis and criticism.* ★12 (Second Term, 0-3s-18).

ART 672. *Industrial Design.* ★10 (First Term, 0-2s-16).

ART 673. *Industrial Design.* ★10 (Second Term, 0-2s-16).

ART 675. *Industrial Design.* ★3 (either term, 0-3s-0).

ART 692. *Visual Communication Design.* ★10 (First Term, 0-2s-16).

ART 693. *Visual Communication Design.* ★10 (Second Term, 0-2s-16).

ART 695. *Visual Communication Design.* ★3 (either term, 0-3s-0).

204.6.5 GRADUATE COURSES IN THE HISTORY OF ART AND DESIGN

ART H 605. *Studies in 19th Century Art I.* ★3 (either term, 0-3s-0).

ART H 606. *Studies in 20th Century Art I.* ★3 (either term, 0-3s-0).

ART H 607. *Studies in Design I.* ★3 (either term, 0-3s-0).

ART H 608. *Special Topics I.* ★3 (either term, 0-3s-0).

ART H 609. *Topics in Iconography.* ★3 (either term, 0-3s-0).

ART H 655. *Studies in 19th Century Art II.* ★3 (either term, 0-3s-0).

ART H 656. *Studies in 20th Century Art II.* ★3 (either term, 0-3s-0).

ART H 657. *Studies in Design II.* ★3 (either term, 0-3s-0).

ART H 658. *Special Topics II.* ★3 (either term, 0-3s-0).

ART H 659. *Directed Readings in Art and Design.* ★6 (0-3s-0).

204.7 Biochemistry

204.7.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Biochemistry offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

(2) The staff of the Department is currently carrying out research in the following fields: cell-virus interactions and mechanisms of viral replication; chemical, physical and biological properties of the nucleic acids; physico-chemical and enzymatic properties of muscle proteins; chemical and physical properties of the proteolytic zymogens and enzymes; the effects of inhibitors, activators and protein reagents on the kinetic and physico-chemical properties of glycogen phosphorylase and other enzymes; the biological control of metabolism; enzymology and mechanisms of protein and nucleic acid biosynthesis; the biosynthesis and metabolism of lipids; the structure and function of biological membranes; x-ray crystallographic studies of molecules of biological importance; electron microscopic studies on the structure and assembly of viruses; metabolism of purines and purine analogues in cancer cells; biochemical characterization of stimulated lymphocytes.

(3) A number of courses from the Departments of Chemistry, Bacteriology, Physiology, Genetics, Botany, and Zoology may be accepted as part of the graduate program in consultation with the Chairman of the Department of Biochemistry.

(4) Prospective candidates should consult the Chairman of the Department regarding research facilities and course requirements. Teaching and research assistantships are available.

204.7.2 GRADUATE COURSES

THES 000. *Thesis.*

BIOCH 501. *Advanced Laboratory.* ★6 (0-0-8).

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). Not offered in 1981-82.

BIOCH 511. *Enzymology.* ★3 (First Term, 3-0-0).

BIOCH 512. *Metabolic and Cellular Control Mechanisms.* ★3 (Second Term, 3-0-0).

BIOCH 521. *Nucleic Acids.* ★3 (First Term, 3-0-0). Not offered in 1981-82.

BIOCH 531. *Chemistry of Proteins.* ★3 (Second Term, 3-0-0). Not offered in 1981-82.

BIOCH 581. *Structure and Function of Biological Membranes I.* ★3 (First Term, 3-0-0).

BIOCH 582. *Structure and Function of Biological Membranes II.* ★3 (Second Term, 3-0-0).

BIOCH 608. *Macromolecular Structure Analysis I.* ★3 (First Term, 3-0-3). Electron Microscopy.

BIOCH 609. *Macromolecular Structure Analysis II.* ★3 (Second Term, 3-0-3). X-ray Crystallography.

BIOCH 623. *Special Topics in Research on Polynucleotides.* ★2 (0-2s-0).

BIOCH 626. *Special Topics in Protein Research.* ★2 (0-2s-0).

BIOCH 630. *Elements of Modern Biophysics.* ★3 (both terms, 1.5-0-0).

BIOCH 671. *Recent Advances.* ★2 (0-2s-0).

204.8 Biology

204.8.1 GENERAL INFORMATION

A number of graduate courses in Biology are offered by members of the Departments of Bacteriology, Botany, Entomology, Genetics, Microbiology, and Zoology. As there is, however, no formal graduate program in general Biology, prospective students should apply to the Department most appropriate to their interests.

204.8.2 GRADUATE COURSES

BIOL 415. *History and Theory of Biology.* ★3 (either term, 3-0-0).

BIOL 420. *Introduction to Theoretical Biology.* ★3 (First Term, 3-0-0).

BIOL 445. *Cell Physiology.* ★3 (Second Term, 3-0-3).

BIOL 507. *Taxometrics.* ★3 (First Term, 3-0-0).

BIOL 584. *Biological Ultrastructure.* ★3 (First Term, 3-0-0).

BIOL 585. *Electron Microscopy.* ★3 (Second Term, 0-0-6).

BIOL 620. *Seminar in Selected Topics of Modern Biology.* Weight according to work done to a maximum of ★3 (Second Term, 0-3s-0).

204.9 Biomedical Engineering and Applied Sciences

204.9.1 GENERAL INFORMATION

Research facilities and lecture courses for graduate programs are offered by the Division of Biomedical Engineering and Applied Sciences, Faculty of Medicine. The programs can be administered wholly by the Division or by the Division in cooperation with Departments in other Faculties. Presently, only the M.Sc. programs are offered wholly within the Division.

The areas most actively encouraged by the Division for research and education are medical physics, organ preservation, cryobiology, clinical and rehabilitation engineering and medical instrumentation.

204.9.2 GRADUATE COURSES

THES 000. *Thesis.*

EE/BE 512. *Physical Measurements in Medicine.* ★3 (Second Term, 3-1s-0). Properties of the cell membrane. Nernst-Planck equation, Donnan membrane, constant field membrane, membrane impedance. Action potentials, voltage clamp measurements, membrane conductance H-H equations, nerve conduction. Mathematical models of the axon. Electrodes. Gas and blood gas analysis. The E.C.G., E.E.G., and the E.M.G., origin and type of these signals, measurement techniques. Blood flow and blood pressure measurements (invasive and non-invasive). Safety aspects of electrical equipment in medicine. Prerequisite: Consent of Department. (□ 3.5).

BEAS 600. *Seminars in Biomedical Engineering and Applied Sciences.* ★2 (First Term, 0-2s-0). A series of seminars designed to expose graduate students to the various areas of research and to provide a forum for progress reports in individual areas. Seminars from research workers from inside and from outside the University will be included. Seminars are held in an informal atmosphere with ample opportunity for discussion.

204.10 Botany

204.10.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Botany offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

(2) The Department has a Controlled Environment Facility consisting of seven plant growth rooms, six Trop-Arctic greenhouses, sixteen standard greenhouse compartments, forty plant growth chambers, and numerous cold storage facilities and seed germinators.

(3) The Department has well-equipped research laboratories for investigations in the following fields: *Structural Botany* — studies of vascular plant development emphasizing seed plant embryology; light and electron microscopy, and histochemistry; *Biochemistry* — the biochemistry of seed germination, pathways for amino acid biosynthesis, studies of transmethylation and transamination reactions, intermediary metabolism of higher plant tissues; *Biological Ultrastructure* — Structure and function of biological membranes with special reference to the fungi; *Bryology* — monographic and evolutionary studies of mosses; ecology and taxonomy of arctic bryophytes; *Ecology* — Studies of aquatic, grassland, parkland, mountain, boreal, sub-arctic and arctic plant communities with emphasis on structure, classification, productivity and physiological ecology; *Lichenology* — taxonomic and ecological studies of lichens; *Morphogenesis* — the control of growth and development in sun and shade conditions; *Mycology* — developmental, taxonomic and ecological studies of wood decay fungi; *Paleobotany* — studies of mega-fossils with emphasis on vascular plants; *Phycology and Limnology* — productivity, ecological, physiological, paleolimnological and distribution studies of phytoplanktonic and benthic algae in lakes and rivers: *Physiology* — aquatic macrophytes, phytochrome and hormonal regulation of growth and development; *Taxonomy* — studies of western Canadian and arctic taxa using a variety of modern techniques including cytology and chemotaxonomy.

(4) A number of undergraduate courses offered by the Department of Botany are also available and may be taken in conjunction with the graduate courses. Senior and advanced courses offered by other departments in the Faculty of Science may be accepted as part of graduate programs in Botany. The Chairman of the Department of Botany must be consulted in the selection of these.

(5) Graduate Assistantships are available for qualified students as well as financial assistance through research grants to staff members in some fields of botany.

204.10.2 GRADUATE COURSES

THES 000. *Thesis.*

BOT 501. *Special Topics in Botany.* ★3 (either term, 0-6L-0). Seminar discussion at an advanced level of topics in a chosen subject area. Prerequisite: Consent of the Department.

BOT 502 & 503. *Special Topics in Botany.* ★2 (either term, 0-4L-0). Seminar discussion at an advanced level of topics in a chosen subject area. Prerequisite: Consent of the Department.

BOT 504. *Advanced Mycology.* ★3 (Second Term, 0-6L-0). Reports and discussion of major and current research in the biosystematics and ecology of the fungi. Evaluation of methods of investigation in these areas. Prerequisites: BOT 341 and 342 or consent of the Department.

BOT 509. *Advanced Structural Botany.* ★2 (First Term, 2-0-0). Seminar discussion of current topics in structural botany including both research and technical advances. Prerequisite: BOT 309 or consent of the Department. Offered in alternate years, next in 1982-83.

BOT 511. *Advanced Plant Ecology.* ★3 (Second Term, 3-0-0). Seminar discussion of major and contemporary topics in plant ecology, using general readings and students' abstracts of published papers. Prerequisite: BOT 322 or equivalent, or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 512. *Vegetation of North America.* ★3 (Second Term, 3-0-0). Lectures and discussions based on students' abstracts of published papers on plant communities, climate, soils, and autecology of species in the major vegetation types from the arctic to the tropics in North America. Prerequisite: BOT 322 or equivalent, or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 513. *Advanced Chemotaxonomy.* ★3 (First Term, 3-0-0). Seminar Course. Assigned readings of phyto chemical-phylogeny, ecology and related areas. Course to include such topics as: Proteins and Plant Phylogeny, Molecular studies of plant populations, Isozymes in plants—non-protein amino acids—roles and functions. Prerequisite: BOT 414, or consent of the Department.

BOT 514. *Advanced Taxonomy.* ★3 (Second Term, 3-0-0). Seminar course with assigned reading, essays and discussion of modern taxonomy, its principles and problems. Prerequisite: BOT 314 or 332 or consent of the Department. Offered alternate years, next in 1982-83.

BOT 531. *Advanced Phycology and Limnology.* ★3 (Second Term, 3-0-0). Seminar course comprising assigned literature reading, essays and discussion of advances in the fields of phycology and limnology. Emphasis will be placed upon ecological, physiological, morphological, and taxonomic aspects of algae, and modern day limnology including physico-chemical as well as biotic aspects. Prerequisite: Consent of the Department. BOT 331 or 431 recommended. Offered in alternate years, next in 1982-83.

BOT 532. *Biosystematics of the Mosses.* ★3 (Second Term, 3-0-0). Lectures, discussions and surveys of the literature of approaches and techniques for studying the phylogeny of mosses. The course will include a historical review of bryology and invited lectures on such topics as phylogenetics, nomenclature, phenetics, biometric analyses of population, experimental taxonomy and herbarium practices. Offered in alternate years, next in 1982-83.

BOT 550. *Physiology of Plant Nutrition.* ★3 (First Term, 3-0-0). The structure and function of plant membranes, mineral uptake and utilization, xylem and phloem transport, photosynthetic productivity, the fixation and metabolism of nitrogen and their role in the total nutritional physiology of the plant. Offered in alternate years, next in 1982-83.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Selected topics in plant metabolism, with particular emphasis on mitochondrial electron transport, phosphorylation, and recent advances in carbon assimilation. Evaluation of current research and investigation in these fields. Recommended: BIOCH 300 or PL SC 431 and 432 or consent of the Departments (offered jointly by the Department of Botany and the Department of Plant Science). The Depart-

ment of Plant Science is responsible for registration. Offered in alternate years, next in 1981-82.

BOT 561. *Advanced Paleobotany.* ★3 (Second Term, 3-0-3). Special problems in paleobotany involving laboratory techniques and reading of current literature and oral and written presentation. Prerequisite: BOT 460 or consent of the Department. Offered in alternate years, next in 1981-82.

BOT 580. *Advanced Mathematical Modelling.* ★3 (Second Term, 3-0-0). Seminars by the students covering the use of modelling in their fields of interest. Modelling projects may be involved according to student interest. Prerequisites: BOT 480 and consent of the Department.

204.11 Business Administration

204.11.1 THE DEGREE OF M.B.A.

(1) The Faculty of Business Administration and Commerce offers a program leading to the degree of Master of Business Administration designed for students preparing for a career in management.

(2) The M.B.A. degree is a two year program designed for students with various educational backgrounds. Since no specific undergraduate major is required for entrance, the particular combination of courses and time required to complete the M.B.A. program will vary according to the academic background of each student. Flexibility has been built into the program to accommodate those who have their undergraduate degree in many areas, including but not limited to Liberal Arts, Education, Engineering, Science or Business.

The first portion of the program consists of core subjects which address the fundamental concepts underlying administration and decision-making. These classes in basic principles are intended to give the student a theoretic foundation, and the tools of analysis upon which advanced classes are built. Completion of all core classes requires one full academic year, and some carry-over into a second year.

The Faculty does not require students to repeat core classes in which they have already developed competence equal to that developed in our core class offerings; however, waivers of core classes are made only on the basis of exemption examinations.

The second portion of the program gives students an opportunity to develop some depth of preparation in fields of their choice by taking advanced classes (500-level courses). For additional flexibility, each student has the option of either writing a thesis, or taking additional advanced classes.

The non-thesis option requires five advanced electives and a research seminar in the student's field of specialization. In addition, one of Business Policy 555 or Business Policy 556 is normally required of all students. Note that at least seven advanced classes are required for the degree, when no thesis is written.

The thesis option requires three advanced electives and a thesis. In addition, one of Business Policy 555 or Business Policy 556 is required. Note that at least four advanced classes are required for the degree, if a thesis is written.

(3) Admission into the M.B.A. program requires the applicant to meet the requirements of the Faculty of Graduate Studies and Research and be approved by the Faculty of Business Administration and Commerce. Approval by the Faculty of Business Administration and Commerce depends upon the undergraduate grades, three letters of reference, statement of purpose explaining how the MBA relates to applicant's career goals, and test score on the *Graduate Management Admission Test.* All applicants are required to write the *Graduate Management Admission Test* and have their scores forwarded to the Associate Dean, Graduate Program, Faculty of Business Administration and Commerce, The University of Alberta, Edmonton, Alberta. Further information and application forms are available from the Examinations and Timetabling Division, Rm. 123, Administration Building.

In addition to the above requirements, all non-Canadian students for whom English is not their native language must write and pass with a minimum score of 600, before formal admission approval can be given, the *Test of English as a Foreign Language.* Further information and application forms are available from the Examinations and Timetabling Division, Rm. 123, Adminstration Building. Results should be forwarded to the Dean, Faculty of Graduate Studies and Research.

(4) The Faculty of Business Administration and Commerce has a limited number of Graduate Assistantships which range from $4,600 to $5,000 (1980-81 scale) depending on the academic status of the student.

All graduate assistantships awarded by the Faculty of Business Administration and Commerce will be determined early in May. Consequently, it will be possible to consider only those applications for study in the M.B.A. program which are complete as of April 30th.

Applicants who are interested in being considered for such awards are strongly urged to complete their applications not later than mid-April. In particular, the *Graduate Management Admission Test* must have been written not later than the March sitting of that test. Registration to write the GMAT must normally be received by the Educational Testing Service approximately one month before the test date.

(5) A limited number of fellowships and scholarships are also available. All students applying for these awards *must* submit their applications to the Student Awards Office by February 1st.

(6) For more information write to the Associate Dean, Graduate Program, Faculty of Business Administration and Commerce.

204.11.2 GRADUATE COURSES

THES 000. *Thesis.*

ACCTG 452. *Introductory Financial Accounting.* ★3 (First Term 3-0-0).

ACCTG 453. *Managerial Control Systems.* ★3 (Second Term 3-0-0).

ACCTG 561. *Seminar in Financial Accounting Theory.* ★3 (First Term, 3-0-0).

ACCTG 562. *Seminar in Management Accounting.* ★3 (Second Term, 3-0-0).

ACCTG 563. *Seminar in Current Accounting Issues.* ★3 (Second Term, 3-0-0).

ACCTG 900. *Non-Thesis Project.* ★3 (variable).

BUS 502. *Seminar in Management Information Systems.* ★3 (either term, 3-0-0).

BUS 553. *Research Methodology.* ★3 (either term, 3-0-0).

BUS 555. *Business Policy I.* ★3 (either term, 3-0-0).

BUS 556. *Business Policy II.* ★3 (either term, 3-0-0).

FIN 456. *Finance.* ★3 (either term, 3-0-0).

FIN 562. *Portfolio Management.* ★3 (First Term, 3-0-0).

FIN 563. *Corporate Financial Planning.* ★3 (Second Term, 3-0-0).

FIN 564. *Risk Management.* ★3 (First Term, 3-0-0).

FIN 565. *Selected Topics in Finance.* ★3 (either term, 3-0-0).

FIN 568. *International Finance.* ★3 (either term, 3-0-0).

FIN 900. *Non-Thesis Project.* ★3 (variable).

IND R 471. *Unions, Management and the Public.* ★3 (either term 3-0-0).

IND R 563. *Labor Relations.* ★3 (First Term, 3-0-0).

IND R 564. *Collective Agreement Administration and Arbitration* ★3 (Second Term, 3-0-0).

IND R 900. *Non-Thesis Project.* ★3 (variable).
LEG R 519. *Tax Factors in Business Decision-Making.* ★3 (either term, 3-0-0).
LEG R 570. *Law, Public Policy and the Canadian Managerial Environment.* ★3 (either term, 3-0-0).
LEG R 571. *Seminar on Products Liability and Consumer Protection.* ★3 (either term, 3-0-0).
LEG R 900. *Non-Thesis Project.* ★3 (variable).
MANEC 463. *Managerial Economics.* ★3 (First Term, 3-0-0).
MANEC 464. *Aggregate Income Analysis.* ★3 (either term, 3-0-0).
MANEC 550. *Pricing.* ★3 (either term, 3-0-0).
MANEC 551. *The Managerial Impact of Regulatory Development.* ★3 (either term, 3-0-0).
MANEC 552. *Government Intervention in Business Management.* ★3 (either term, 3-0-0).
MANEC 555. *Transportation Management.* ★3 (either term, 3-0-0).
MANEC 556. *Urban Management.* ★3 (either term, 3-0-0).
MANEC 567. *Selected Topics in Managerial Economics.* ★3 (either term, 3-0-0).
MANEC 569. *Energy Industry Policy.* ★3 (either term, 3-0-0).
MANEC 900. *Non-Thesis Project.* ★3 (variable).
MARK 458. *Marketing.* ★3 (either term, 3-0-0).
MARK 561. *Marketing Research.* ★3 (either term, 3-0-0).
MARK 564. *Consumer Behaviour.* ★3 (either term, 3-0-0).
MARK 565. *Quantitative Marketing Management.* ★3 (either term, 3-0-0).
MARK 566. *Marketing Public Programs.* ★3 (either term, 3-0-0).
MARK 567. *Communication Processes in Marketing.* ★3 (either term, 3-0-0).
MARK 569. *Product Management.* ★3 (either term, 3-0-0).
MARK 570. *International Marketing.* ★3 (either term, 3-0-0).
MARK 900. *Non-Thesis Project.* ★3 (variable).
MGTSC 459. *Quantitative Decision Analysis under Uncertainty.* ★3 (First Term, 3-0-0).
MGTSC 461. *Management Science.* ★3 (Second Term, 3-0-0).
MGTSC 462. *Statistical Inference in Business.* ★3 (Second Term, 3-0-0).
MGTSC 500. *Seminar in Quantitative Methods in Business I.* ★3 (either term, 3-0-0).
MGTSC 501. *Seminar in Quantitative Methods in Business II.* ★3 (Second Term, 3-0-0).
MGTSC 503. *Production and Operations Management.* ★3 (First Term, 3-0-0).
MGTSC 504. *Applied Time Series Analysis.* ★3 (First Term, 3-0-0).
MGTSC 520. *Multivariate Statistical Methods in Business.* ★3 (either term, 3-0-0).
MGTSC 900. *Non-Thesis Project.* ★3 (variable).
ORG A 470. *The Individual in Groups and Organizations.* ★3 (either term, 3-0-0).
ORG A 472. *Organization Theory and Administrative Practice.* ★3 (either term, 3-0-0).
ORG A 552. *Selected Topics in Behavioral Science.* ★3 (either term, 3-0-0).
ORG A 557. *Advanced Seminar in Personality and Organizations.* ★3 (either term, 3-0-0).
ORG A 558. *Advanced Seminar on Theories of Organizations.* ★3 (either term, 3-0-0).
ORG A 565. *Seminar in Personnel Administration.* ★3 (either term, 3-0-0).
ORG A 598. *Seminar in the Management of Complex Organizations.* ★3 (either term, 3-0-0).
ORG A 900. *Non-Thesis Project.* ★3 (variable).

204.12 Cartography

The Department of Geography offers the following courses in Cartography: Cartography 411, 421, 431, 451, 461, 511, 521, 601. There is however, *no* separate graduate program in cartography and prospective students should apply to the Department of Geography. For a more detailed description of the courses see § 204.35.2.

204.13 Chemical Engineering

204.13.1 THE DEGREES OF M.ENG., M.SC. AND PH.D.

(1) The Department of Chemical Engineering offers facilities for advanced training and research leading to the Master of Engineering, Master of Science, and Doctor of Philosophy degrees in Chemical Engineering. A program leading to a Master of Science or Master of Engineering in Process Control (Chemical Engineering) is also available for students wishing to specialize in this area.

(2) General fields for research include fluid mechanics and rheology, reaction kinetics and catalysis, mass transfer and separation processes, heat transfer, thermodynamics, hydrocarbon P-V-T and phase equilibrium studies, polymer reactor engineering, process dynamics and control, on-line computer data acquisition and control, mathematical modeling and environmental engineering. Many research programs are orientated towards better utilization of natural resources in the Province, e.g., processing of Athabasca oil sands, natural gas and petroleum feedstocks.

Emphasis is given to computer applications both in the courses of instruction and in research. This is made possible through interest of the staff and through the facilities that are available in the Department Data Acquisition Control and Simulation Centre and through the University Computing Services. Instruction is offered in computer oriented mathematical techniques, modeling, analog and digital computer simulation, systems engineering, and in real-time computer applications.

(3) For the Master of Engineering program, work equivalent to ten single-term courses plus the engineering project, Chemical Engineering 900 must be completed. The courses are of the same type and calibre as those taken by M.Sc. and Ph.D. candidates. The project may be completed within a three to six week period following the regular winter session, so that the M.Eng. program may be completed in a minimum of nine months of full-time study. The minimum residence requirement is one term for a B.Sc. graduate with at least one year post-B.Sc. experience. The maximum time permitted for completion of a Master of Engineering program is five years from the date of first registration.

(4) For the M.Sc. degree, graduate work equivalent to a minimum of twelve months of full-time study is required for a student possessing an undergraduate degree in the same field from a recognized university. In the M.Sc. and M.Eng. programs the Department will also accept qualified applicants with degrees in other fields of engineering. Graduates with non-engineering backgrounds may be admitted under special arrangements which may involve the completion of certain undergraduate engineering courses. M.Sc. programs normally consist of six single-term courses plus seminar, research and thesis. Certain graduate courses are mandatory. Details of all programs must be worked out in consultation with the Department.

(5) For the Ph.D. program, in addition to the requirements of the Faculty of Graduate Studies and Research, the Department requires the candidate to have satisfactorily completed at least 39 term hours of formal course work. Of these, 21 term hours should be selected from courses offered by the Department of Chemical Engineering, 12 term hours should be from courses outside the Department, and not less than 6 term hours of the total must be outside the Faculty of Engineering.

(6) A student who intends to study for the Ph.D. degree is required to pass a set of written Ph.D. preliminary examinations. These examinations, which embrace the major fields of Chemical Engineering, are normally taken by the student after one year of graduate studies. Although the timing depends on circumstances, the Ph.D. preliminary examinations are normally held in early January and in May.

(7) Graduate Assistantships are available for qualified students on a part-time or full-time basis with remuneration according to the student's background and the hours of service. Scholarships and fellowships are available for research in Chemical Engineering. Summer assistance can usually be arranged for students continuing their research through the summer months without scholarship support.

204.13.2 GRADUATE COURSES

THES 000. *Thesis.*

CH E 610. *Advanced Mass Transfer Operations.* ☐3.0 (Second Term, 3-0-0). (★3.)

CH E 612. *Advanced Fluid Mechanics.* ☐3.0 (First Term, 3-0-0). Potential, boundary layer, viscometrics, and secondary flows; application to multiphase phenomena. (★3.)

CH E 613. *Selected Topics in Mass Transfer.* ☐3.0 (Second Term, 3-0-0). A study of fundamental mass transfer with emphasis on gas-liquid and liquid-liquid dispersions, simultaneous mass transfer and chemical reaction and simultaneous heat and mass transfer. (★3.)

CH E 614. *Advanced Heat Transfer.* ☐3.0 (Second Term, 3-0-0). Design problems involving conductive, convective, and radiant heat transfer. (★3.)

CH E 615. *Advanced Separation Processes.* ☐3.0 (First Term, 3-0-0). Design of separation processes for multicomponent and non-ideal systems. Emphasis on distillation, absorption, extraction, azeotropic and extractive distillation and adsorption. (★3.)

CH E 616. *Rheology and Polymer Processing.* ☐3.0 (Second Term, 3-0-0). Non-Newtonian fluids; non-viscometric deformations; turbulence theory for viscous and visco-elastic fluids. Prerequisite: CH E 612 or consent of the instructor. (★3.)

CH E 622. *Advanced Physical Properties and Behavior of Petroleum Fluids.* ☐3.0 (First Term, 3-0-0). Phase behavior of multicomponent hydrocarbon and hydrocarbon-non-hydrocarbon systems; prediction of equilibrium ratios. (★3.)

CH E 624. *Advanced Thermodynamics.* ☐3.0 (First Term, 3-0-0). Principles of thermodynamics; properties of homogeneous fluid phases; phase and chemical equilibria; application to industrial problems. (★3.)

CH E 634. *Advanced Chemical Reactor Design.* ☐3.0 (First Term, 3-0-0). Design of homogeneous and heterogeneous reactors for isothermal and non-isothermal operation; analysis of rate data; transport processes in heterogeneous catalytic systems. (★3.)

CH E 636. *Advanced Chemical Kinetics and Catalysis.* ☐3.0 (First Term, 3-0-0). Gas phase reactions; kinetics in liquid solutions; characterization of catalysts; heterogeneous catalysts. (★3.)

CH E 640. *Real-Time Computer Applications.* ☐4.5 (First Term, 3-0-3). Introduction to real-time computer hardware and operating systems; data acquisition techniques; analog supervisory and direct-digital control; applications involving research experiments, analytical instruments and analog-digital computer hybrid systems; data processing techniques. Laboratory will involve student use of Department's HP/1000 system and interfaced applications. (★3.)

CH E 642. *Dynamics of Process Systems.* ☐3.8 (Second Term, 3-0-3/2). Analysis and simulation of the dynamics of chemical engineering systems; process identification techniques; on-line characterization of process dynamics. Prerequisite: CH E 542 or equivalent. (★3.)

CH E 644. *Advanced Topics in Process Control.* ☐3.8 (Second Term, 3-0-3/2). Selected topics on multivariable systems, adaptive control, optimal control, and the stability of nonlinear systems. Emphasis is placed on control problems appearing in the recent technical literature. Prerequisite: E E 655 or consent of the instructor. (★3.)

CH E 654. *Decision Analysis.* ☐3.0 (First Term, 3-0-0). Applications of Bayesian statistical decision theory to general systems problems, using both analytical and computer-based numerical methods, with emphasis on formulating a proper utility function, building suitable mathematical models, and making Bayesian inferences from data. (★3.)

CH E 674. *Numerical Solutions of Engineering Problems.* ☐3.0 (First Term, 3-0-0). Analysis of the structural features of certain classes of multidimensional variational problems; formulation of approximating functions; numerical solution of certain partial differential equations; linear programming; dynamic programming; and optimization. A basic knowledge of numerical techniques and of computer programming is a prerequisite. (★3.)

CH E 676. *Applied Mathematics I.* ☐3.0 (either term, 3-0-0). Application of mathematics to engineering problems with emphasis on operator methods. (★3.)

CH E 678. *Applied Mathematics II.* ☐3.0 (either term, 3-0-0). Application of mathematics to engineering problems with emphasis on tensor analysis. (★3.)

CH E 682. *Graduate Seminar.* ☐0.5 (0-1s-0). Discussion of progress and problems in research underway in the Department.(★1.)

CH E 694. *Advanced Topics in Chemical Engineering.* ☐3.0 (either term, 3-0-0). An advanced treatment of selected chemical engineering topics of current interest to staff and students. (★3.)

CH E 900. *Non-Thesis Project.* ☐3.0 (approximately 3 weeks at end of term). An engineering project course for students registered in a Master of Engineering program. (★3.)

204.13.3 READING PROJECTS

Credit will be allowed up to a maximum course weight of six units in any one project.

CH E 713. *Mass Transfer.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 714. *Heat Transfer.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 716. *Fluid Mechanics.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 724. *Thermodynamics.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 736. *Applied Kinetics and Catalysis.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 742. *Process Dynamics.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 744. *Process Control.* ☐3.0 (either term, 3-0-0). (★3.)

CH E 754. *Operations Research.* ☐3.0 (either term, 3-0-0). (★3.)

204.14 Chemistry

204.14.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Chemistry has research laboratories and instructional facilities for at least one hundred and fifty graduate students proceeding to the M.Sc. and Ph.D. degrees in Chemistry.

(2) The active research interests of the staff include:

(i) *Analytical:* electroanalytical and spectro electrochemical techniques, analysis of substances of biological interest, gas and liquid chromatography, nuclear magnetic resonance studies of the solution chemistry of metal complexes and the acid-base and coordination chemistry of biological molecules, inductively coupled plasma emission spectroscopy, application of electronic image sensors to spectrochemical measurements, acquisition and processing of analytical data with mini-computers and microprocessors, solvent effects on solute properties and reactions, applications of nonaqueous systems to analysis, chemical speciation, liquid chromatography and solvent extraction.

(ii) *Inorganic:* photoelectron spectroscopy, phosphorane chemistry, transition metal complexes,

organometallic compounds, metal carbonyls, mechanisms of inorganic reactions in solution, x-ray crystallography.

(iii) *Organic:* structural and synthetic studies on natural products, degradation of natural products, heterocyclic chemistry, mono- and di-saccharides, selective reductions, organometallic chemistry, pyrolysis mechanisms of pyrazolines and other organic compounds, mechanisms and stereo-chemistry of solvolytic reactions, small rings, reactive intermediates (ylides, carbenes, nitrenes), alkali metal aromatic complexes, organic photochemistry, acetylenes, allenes, free radicals, conformation and synthesis of carbohydrates, structure activity correlations of antibiotics, synthetic and mechanistic investigations in the heterocyclic field with emphasis on the applications of nuclear magnetic resonance and electron paramagnetic resonance, mechanism of free radical reactions, photocyclo addition—fragmentation reactions, the invention of new reagents. Mechanism and stereochemistry of enzymatic reactions, radiochemical synthesis. Nucleic acid component chemistry, nucleoside antibiotics and bioactive analogues.

(iv) *Physical:* Infrared and Raman spectra (4000 - 10 cm^{-1} of solids and gases. High-pressure phases. Dielectric Relaxation. Enzyme mechanisms, oxygen radicals in biology Radiation chemistry. Behavior of electrons in liquids. Photochemical synthesis and kinetics. Electron spin resonance. Flash photolysis. Mass spectrometry. Electronic absorption and emission spectroscopy. The chemical behavior of ions in gases. Ion molecule reactions. Chemical ionization. Biophysical chemistry involving studies on the nature of substrate-metal ion-enzyme complexes using NMR and EPR techniques. Hydrogen bonding and solvation equilibria by NMR. Molecular motion in fluids. NMR Photochemistry, chemical kinetics and petroleum chemistry. Free radical chemistry. Flash spectroscopy and flash mass spectrometry.

(v) *Theoretical:* Excited state wave functions; theory of vibration-rotation. Theoretical dynamics of unstable and oscillatory chemical reaction networks, statistical mechanics of fluctuations near instabilities. Theoretical study of atomic and molecular structure. Theory of atomic and molecular collisions; many-electron problem in solids; vibrational and vibronic dynamics.

(3) Candidates for the M.Sc. and Ph.D. degrees in Chemistry should be graduates in Chemistry or Chemical Engineering from approved universities, who meet the entrance requirements of the Faculty of Graduate Studies and Research.

(4) *The M.Sc. Program:* A minimum of three single-term graduate lecture courses in Chemistry must be passed.

A research project must be carried out, the results of which are presented in thesis form, followed by an oral examination.

(5) *The Ph.D. Program:* For students in *analytical, inorganic and physical* chemistry: six single-term courses, of which at least five are honors or graduate courses in chemistry, must be included. In some circumstances, advance credit for graduate courses in chemistry taken elsewhere may be granted, up to a maximum of two single-term courses. Students in *organic* chemistry must take four single-term honors or graduate courses and write monthly cumulative examinations in organic chemistry until seven have been passed.

A special chemical physics program is also available which allows increased emphasis on physics and mathematics.

Every student must possess a reading knowledge of one language other than English. The limitations on this language vary with the division in which the Ph.D. degree is sought.

For the *inorganic* and *organic* fields the language requirement shall be German.

For the *physical* and *theoretical* fields the language requirement shall be one of French, German or Russian at the discretion of the research supervisor.

For the *analytical* field the requirement shall be any language in which there is a significant chemical literature, and which is approved by the Analytical Division.

Every student must also present a seminar on a topic other than his/her research program. When these requirements are nearly completed each Ph.D. student must pass an oral candidacy examination in subjects relevant to the general field of research. Finally the results of the student's research are presented in thesis form and orally to an examining committee, and as a seminar to the Department as a whole.

(6) The minimum time required for an M.Sc. degree is twelve months after an honors B.Sc. degree in Chemistry, or a four-year specialized program in Chemistry. The minimum time required for a Ph.D. degree is three academic years of study and research after a four year B.Sc. degree or two academic years after an M.Sc. degree. The length of time in each depends on the student's progress and the amount of time which can be devoted to study and research.

(7) Financial assistance is normally available for all graduate students who maintain a satisfactory performance. This is in the form of scholarships, and Graduate Assistantships.

(8) Information may be obtained by writing the Chairman of the Department.

204.14.2 GRADUATE COURSES

THES 000. *Thesis.*

CHEM 505. *Special Topics in Chemistry.* ★3 (either term, 3-0-0).

CHEM 507. *Computing Applications for Chemistry.* ★3 (either term, 3-0-3/2).

CHEM 511. *Instrumentation in Chemical Analysis.* ★3 (First Term, 3-0-6).

CHEM 513. *Electronics for Scientists.* ★3 (Second Term, 3-0-3).

CHEM 515. *Analytical Electrochemistry.* ★3 (Second Term, 3-0-0).

CHEM 517. *Analytical Spectroscopy.* ★3 (Second Term, 3-0-3).

CHEM 519. *Advanced Analytical Chemistry.* ★3 (First Term, 3-0-0).

CHEM 521. *Analytical Separations.* ★3 (First Term, 3-0-3).

CHEM 533. *Structure in the Solid State.* ★3 (First Term, 3-0-0).

CHEM 537. *Transition Metal Chemistry.* ★3 (Second Term, 3-0-0). Prerequisite: CHEM 431.

CHEM 539. *Inorganic Reaction Mechanisms.* ★3 (First Term, 3-0-0).

CHEM 551. *Qualitative Organic Analysis.* ★3 (First Term, 2-0-6).

CHEM 553. *Chemistry of Carbohydrates.* ★3 (Second Term, 3-0-0).

CHEM 555. *Theoretical Organic Chemistry.* ★3 (First Term, 3-0-0).

CHEM 559. *Natural Products.* ★3 (either term, 3-0-0).

CHEM 561. *Advanced Organic Synthesis.* ★3 (either term, 3-0-0).

CHEM 573. *Chemical Kinetics (Rates and Mechanisms).* ★3 (Second Term, 3-0-0).

CHEM 575. *Magnetic Resonance and its Chemical Applications.* ★3 (First Term, 3-0-0).

CHEM 581. *Chemical Thermodynamics.* ★3 (First Term, 3-0-0).
CHEM 585. *Infrared and Raman Spectroscopy.* ★3 (Second Term, 3-0-0).
CHEM 587. *Special Topics in Free Radical Chemistry.* ★3 (Second Term, 3-0-0).
CHEM 589. *Statistical Mechanics.* ★3 (First Term, 3-0-0).
CHEM 591. *Radiation Chemistry.* ★3 (First Term, 3-0-0).
CHEM 593. *Molecular Spectroscopy.* ★3 (First Term, 3-0-0).
CHEM 595. *Photochemistry.* ★3 (Second Term, 3-0-0).
CHEM 602. *Departmental Research Seminar.* ★0 (0-2s-0).
CHEM 604. *Advanced Research Seminar.* ★0 (0-2s-0).
CHEM 619. *Special Topics in Advanced Analytical Chemistry.* ★3 (either term, 3-0-0).
CHEM 631. *Organometallic Chemistry.* ★3 (Second Term, 3-0-0).
CHEM 635. *Chemistry of the Metal Carbonyls.* ★3 (Second Term, 3-0-0).
CHEM 637. *Topics in Structural Inorganic Chemistry.* ★3 (First Term, 3-0-0).
CHEM 641. *X-ray Crystallography.* ★3 (First Term, 3-0-0). Prerequisite: CHEM 533.
CHEM 643. *Chemical Application of Photoelectron Spectroscopy.* ★3 (Second Term, 3-0-0).
CHEM 655. *Physical Methods of Organic Chemistry.* ★3 (either term, 3-0-0).
CHEM 657. *Physical Organic Chemistry.* ★3 (First Term, 3-0-0).
CHEM 663. *Heterocyclic Chemistry.* ★3 (First Term, 3-0-0).
CHEM 665. *Chemistry of Nucleosides and Nucleotides.* ★3 (Second Term, 3-0-0). Prerequisites: CHEM 551 and 555.
CHEM 667. *Free Radical Reactions in Organic Chemistry.* ★3 (Second Term, 3-0-0).
CHEM 675. *Magnetic Resonance Spectroscopy.* ★3 (First Term, 3-0-0).
CHEM 683. *Quantum Chemistry.* ★3 (First Term, 3-0-0).
CHEM 684. *Principles of Quantum Mechanics with Chemical Applications.* ★6 (3-0-0).
CHEM 685. *Solution Kinetics.* ★3 (First Term, 3-0-0).
CHEM 699. *Chemical Applications of Mass Spectrometry.* ★3 (Second Term, 3-0-0).

204.15 Civil Engineering

204.15.1 THE DEGREES OF M.ENG., M.SC., AND PH.D.

(1) The Department of Civil Engineering offers programs leading to the degrees of Doctor of Philosophy, Master of Science and Master of Engineering. Programs are offered in the fields of engineering materials, highways and transportation, hydraulics and hydrology, sanitary and environmental engineering, soil mechanics and foundations, structures and solid mechanics, and welding engineering.

(2) Doctor of Philosophy programs are offered in most fields of Civil Engineering. Courses in a Ph.D. program are selected by the supervisory committee in consultation with the student to provide depth in a major area of study and a related minor area of study. There is no fixed number of required courses.

(3) Master of Science programs normally consist of eight single-term courses or equivalent, five of which must be in the candidate's major field of interest, plus a thesis. Other weightings between course work and thesis may be arranged. A candidate may complete a Master of Science program in twelve months. However, a student is advised to spend two winter sessions, during which more time can be devoted to the thesis topic.

(4) Master of Engineering programs consist of ten single-term courses plus a project which is approximately equivalent to a single-term course. A candidate may complete a Master of Engineering program in a minimum of nine months. The minimum residence required is one term for a B.Sc. graduate with at least one year of post-B.Sc. experience and one session for a B.Sc. graduate with less than one year of post-B.Sc. experience. The maximum time permitted for completion of a Master of Engineering program is four years from the date of first registration.

(5) Active research areas in the Department include various aspects of: soil mechanics and foundations; arctic geotechnology; transportation engineering and highway materials; concrete and cementitious materials; structural behavior of concrete, steel, and timber members and frames; structural analysis and solid mechanics; hydraulics, hydrology and river behavior; sanitary and environmental engineering. Details are available on request.

(6) Financial assistance is available, through the Department, in the form of Graduate Assistantships. Preference is given to Ph.D. and M.Sc. candidates.

(7) Inquiries should be directed to the Chairman of the Civil Engineering Department.

204.15.2 GRADUATE COURSES

THES 000. *Thesis.*
CIV E 601. *Cement and Concrete Technology.* □3.0 (either term, 3-0-0). Properties of plain concrete with emphasis on the physicochemical aspects of behavior. (★3.)
CIV E 609. *Special Topics in Civil Engineering.* □3.0 (either term, 3-0-0). (★3.)
CIV E 610. *Pavement Design.* □3.0 (First Term, 3-0-0). Pavements performance and evaluation; stresses and displacements in layered systems; theories and principles of flexible and rigid pavement design and construction; rehabilitation of pavements and cost analysis. (★3.)
CIV E 611. *Pavement Materials.* □3.0 (Second Term, 3-0-0). Source, manufacture, properties, tests and specifications of bituminous materials; properties and testing of aggregate, bituminous and stabilized mixtures; construction and quality control. (★3.)
CIV E 612. *Transportation Design.* □3.0 (First Term, 3-0-0). Introduction to all modes of transportation; principles of geometric design of transportation facilities including highways, railways, airports and parking terminals; economics of location. (★3.)
CIV E 613. *Transportation Systems Analysis.* □3.0 (Second Term, 3-0-0). Urban and regional transport planning; travel demand forecasting; origin-destination analysis; trip distribution models; network analysis; economic principles in transportation; freight transport; strategy of transport planning. (★3.)
CIV E 614. *Transportation Engineering.* □3.0 (First Term, 3-0-0). Principles of traffic psychology; introduction to theory of traffic flow; traffic capacity of highways, interchanges and urban roads; traffic operations; traffic control devices and signal systems; principles of street illumination; principles of air traffic and railway traffic operations. (★3.)
CIV E 615. *Functional Planning and Geometric Design.* □3.5 (Second Term, 2-0-3). Types of interchanges, network planning and other facets of functional planning, geometric design, merging and diverging movements, environmental and safety factors. (★3.)
CIV E 616. *Public Transportation.* □3.0 (Second Term, 3-0-0). Public transport networks; population and transport network densities; traffic prediction and choice of transport mode; capacity and operating characteristics of various types of public transport; design characteristics of various transit systems; integration with urban planning. (★3.)
CIV E 619. *Advanced Topics in Transportation and Highway Engineering.* □3.0 (either term, 3-0-0). (★3.)
CIV E 620. *Environmental Engineering Measurements I.* □4.0 (First Term, 1-0-6). Theory and procedures for determining the quality of natural water, potable water and wastewater. Determination of pollution loads, and trace contaminants. Sampling procedures and sample processing. Solid waste characterization and basic air pollution monitoring. (★3.)
CIV E 621. *Municipal Distribution and Collection Systems.* □3.0 (First Term, 3-0-0). Detailed and advanced design of water supply systems, sewerage and storm drains. Rates of flow, hydraulics of networks and sewers, rainfall-runoff analysis,

storm water storage, loads on conduits are examined. Solid waste collection and processing systems. (★3.)

CIV E 622. *Physical/Chemical Water and Wastewater Treatment.* ☐3.0 (Second Term, 3-0-0). Theory and design of chemical and physical unit processes utilized in the treatment of water and wastewater. Sedimentation, flotation, coagulation, precipitation, filtration, disinfection, ion exchange, reverse osmosis, adsorption, and gas transfer. (★3.)

CIV E 623. *Industrial Water and Wastewater Management.* ☐3.0 (Second Term, 3-0-0). Industrial water quantity and quality requirements. Characteristics of wastes, inplant controls, product recovery; effluent characteristics, chemical and toxic properties, pretreatment and treatment design theory and methodology, water reclamation and reuse, regulations. (★3.)

CIV E 624. *Biological Waste Treatment Processes.* ☐3.0 (Second Term, 3-0-0). Study of the theoretical and applied aspects of wastewater treatment by activated sludge, fixed and moving biological films, conventional and aerated lagoons, sludge digestion, septic tanks, land treatment, and nutrient removal. Guidelines, regulations and economics. System analysis and design of facilities. (★3.)

CIV E 625. *Engineering Management of Water Quality.* ☐3.0 (Second Term, 3-0-0). Concepts, rationale, theory, institutions and engineering aspects of water quality management. Methods of water quality management, oxygen, chemical and microbial models, natural and induced reaeration techniques, thermal pollution and ice cover considerations. (★3.)

CIV E 626. *Environmental Health Engineering.* ☐3.0 (either term, 3-0-0). Environmental contaminants, their sources, and effects on humans and other biota. Risk assessment. Air quality (health considerations and management). Radiological wastes and their control. Noise sources, health considerations and control techniques. (★3.)

CIV E 627. *Environmental Engineering Measurements II.* ☐4.0 (Spring Session, 1-0-6). Laboratory projects to present techniques for obtaining data and relationships needed for design of treatment facilities. Project objectives, design methods, analytical approaches, data interpretation, and presentation. (★3.)

CIV E 629. *Advanced Topics in Environmental Engineering.* ☐3.0 (either term, 3-0-0). (★3.)

CIV E 630. *Open Channel Flow.* ☐3.0 (First Term, 3-0-0). Analysis of open channel flow in rectangular and non-rectangular channels using graphical and computer methods. Resistance to flow, specific energy, force-momentum, transitions, gradually varied flow, spatially varied flow, rapidly varied flow. Introduction to unsteady flow in open channel. (★3.)

CIV E 631. *Engineering Fluid Mechanics.* ☐3.0 (First Term, 3-0-0). Navier-Stokes equations and simple solutions. Euler and Bernoulli equations and some simple hydrodynamic flows. Stokes flow and boundary layers. Introduction to turbulent flow and semi-empirical theories. Turbulent flow in pipes and channels. Elementary two phase flow in pipes and channels. Dimensional analysis. (★3.)

CIV E 632. *Hydraulic Structures.* ☐3.0 (either term, 3-0-0). The hydraulic design of water handling structures used for retention, conveyance control, regulation and energy dissipation, drainage, navigation, flood control and other civil engineering schemes. Hydraulic models. (★3.)

CIV E 633. *Unsteady Flow in Pipes and Channels.* ☐3.0 (Second Term, 3-0-0). Solution of unsteady flow equations for waterhammer and surge problems by graphical and numerical methods. Applications to pipes with valves, pumps and turbines and to open channels with varying channel shape and end conditions. (★3.)

CIV E 634. *Applied Hydrodynamics.* ☐3.0 (either term, 3-0-0). Euler and Bernoulli equations. Basic flows and combinations. Conformal transformation and free streamline theory. Vortex motion and small amplitude wave theory. (★3.)

CIV E 635. *Turbulent Flow.* ☐3.0 (either term, 3-0-0). Transition from laminar to turbulent motion. Reynolds and energy equations. Pipes and channel flows. Turbulent boundary layers with and without pressure gradient on smooth and rough walls. Separation phenomenon and separated flows. Simple and compound jets, wall jets and wakes. (★3.)

CIV E 636. *Ice Engineering.* ☐3.5 (either term, 3-0-1). Freeze-up, winter and breakup processes (continental and marine), hydraulics of flow under an ice cover, elementary heat transfer, formation and growth of ice types, mechanical properties of ice, structural behavior of ice sheets, design for the effects of ice on river, lake and coastal installations, design of ice bridges. (★3.)

CIV E 639. *Advanced Topics in Fluid Mechanics and Hydraulics.* ☐3.0 (either term, 3-0-0). (★3.)

CIV E 640. *River Engineering.* ☐3.5 (Second Term, 3-0-1). Hydraulics of flow in alluvial channels. Theories of channel-bed stability, channel self-adjustment, and sediment transport. Methods of river surveys. Use of air photos. Bridge hydraulics, river stabilization, water intakes, and other engineering works. Biological and environmental considerations. (★3.)

CIV E 641. *Surface Water Hydrology.* ☐3.0 (either term, 3-0-0). Precipitation — runoff measurement and analysis, infiltration energy-evaporation-evapotranspiration, hydrograph analysis, peak flows, flood routing, snowmelt, mathematical modelling, statistical methods. (★3.)

CIV E 642. *Risk and Decision in Civil Engineering.* ☐3.0 (Second Term, 3-0-0). Analysis of data, models and solutions in respect to decision making for Civil Engineering problems such as quality control, safety of structures, traffic flow, transportation planning, watershed management, water supply, measurement theory, simulation, natural phenomena. (★3.)

CIV E 643. *Flow Through Porous Media.* ☐3.5 (either term, 3-0-1). Classical and numerical methods of ground water flow analysis. Analogue methods. Unsteady flow problems. Equilibrium and non-equilibrium, well pumping equations with different boundary conditions, well testing, safe yield. Other selected problems. (★3.)

CIV E 644. *Sediment Transport.* ☐3.0 (either term, 3-0-0). Fundamentals of two phase flow in open channels, mechanical properties of the flow, dimensionless expression for two phase flow, initiation of motion, sediment transport rate by various formulas, bed forms (ripples, dunes, etc). (★3.)

CIV E 649. *Advanced Topics in Hydrology.* ☐3.0 (either term, 3-0-0). (★3.)

CIV E 660. *Advanced Structural Analysis I.* ☐3.0 (First Term, 3-0-0). Fundamentals of the classical flexibility and stiffness methods of structural analysis. Matrix techniques for structural analysis. (★3.)

CIV E 661. *Advanced Structural Analysis II.* ☐3.0 (Second Term, 3-0-0). Matrix analysis of three dimensional structures. Matrix formulation for vibration and stability problems. Energy formulations. Prerequisites: CIV E 660 and CIV E 664. (★3.)

CIV E 663. *Design of Shell Structures.* ☐3.0 (either term, 3-0-0). (offered alternate years) Assumptions, derivation and limitations of shell theory as applied to the design of folded plate structures; storage structures consisting of shells of revolution; cylindrical and paraboloid roof shells. Emphasis is placed on design problems. (★3.)

CIV E 664. *Introduction to Solid Mechanics.* ☐3.0 (either term, 3-0-0). Formulation of Basic Equations in solid mechanics. Cartesian tensor and dyadic notations. Variational principles. (★3.)

CIV E 665. *Introduction to the Finite Element Method.* ☐3.0 (Second Term, 3-0-0). Fundamentals of the formulation and application of the finite method to problems of continuum mechanics with special reference to Civil Engineering, including problems in solid mechanics, fluid mechanics and soil mechanics. (★3.)

CIV E 666. *Structural Concepts.* ☐3.0 (Second Term, 3-0-0). Basic concepts of structural analysis and design. Approximate analyses, integration of structural components into structural systems, loadings and development of load factors. (★3.)

CIV E 667. *Advanced Topics in the Finite Element Method.* ☐3.0 (First Term, 3-0-0). Convergence criteria, equilibrium and hybrid elements. Application of finite element methods to problems in stability, dynamics, plates and shells. Treatment of geometric and material nonlinearities. Prerequisite: CIV E 665. (★3.)

CIV E 670. *Behavior and Design of Steel Members.* ☐3.0 (First Term, 3-0-0). Material properties and plate buckling problems. Behavior and design of steel tension and compression members, beams and beam-columns. Behavior and design of welded and bolted connections. This course is designed to give the student an understanding of the individual members which form the steel structure. (★3.)

CIV E 671. *Behavior and Design of Steel Structures.* ☐3.0 (Second Term, 3-0-0). Brittle fracture and fatigue problems. Behavior and design of composite beams and plate girders.

Discussion of frame behavior; overall buckling and instability concepts as related to the design of columns and bracing systems. This course is designed to build on the material contained in CIV E 670 and to give the student an insight into the behavior of the total structure. (★3.)

CIV E 672. *Behavior and Design of Reinforced Concrete Members.* □3.0 (First Term, 3-0-0). Strength and behavior of simple reinforced concrete members. Relation between results of research and current design specifications. Members subjected to flexure, axial compression, combined flexure and axial load, combined flexure and shear, torsion. (★3.)

CIV E 673. *Behavior and Design of Concrete Structures.* □3.0 (Second Term, 3-0-0). Strength and behavior of statically indeterminate reinforced concrete structures. Elastic and limit analysis and design considerations for continuous slab systems, frames and shear walls. Frame stability. (★3.)

CIV E 674. *Behavior and Design of Prestressed Concrete Structures.* □3.0 (either term, 3-0-0). Principles and methods of prestressing. Service load design and analysis. Behavior and strength design. Losses in prestress and anchorage zone stresses. Discussion of design specifications. (★3.)

CIV E 675. *Structural Analysis and Design.* □3.0 (Second Term, 3-0-0). Analysis of beams, arches and slabs. Behavior of steel and concrete structures. Design of slab systems, piers and abutments, retaining walls and bulkheads. Note: This course is designed primarily for students majoring in the fields of Soil Mechanics and Hydraulics. (★3.)

CIV E 676. *Behavior and Design of Masonry Structures.* □3.0 (Offered alternate years) (Second Term, 3-0-0). Historical developments. Masonry units, mortars and grouts. Behavior, strength and stability of masonry under axial compression. Reinforced masonry in bending and combined axial load and bending. Ductility and joint control. Design application including discussion of Code requirements. (★3.)

CIV E 679. *Advanced Topics in Structural Engineering.* □3.0 (either term, 3-0-0). (★3.)

CIV E 680. *Engineering Properties of Soils.* □4.0 (First Term, 3-1s-1). Principle of effective stress, clay-water systems, soil compressibility and theories of consolidation. Pore pressure parameters. Strength of granular and cohesive media. Anisotropy of soils. Laboratory measurement of strength and deformation properties. Stress strain relations. (★3.)

CIV E 681. *Seepage and Drainage.* □4.0 (First Term, 3-1s-1). Elements of hydrogeology; regional groundwater flow, borehole logging methods. Theory of groundwater flow through soils and rocks; permeability, Darcy's law, field governing equations and their solution by approximate methods, finite difference and finite element methods, unsaturated flow. Civil engineering applications, seepage in earth structures, design of dewatering systems for excavations and slopes, field testing, grouting. (★3.)

CIV E 683. *Site Investigation Practice.* □2.0 (First Term, 2-0-0). Techniques of site investigation for geotechnical engineering, in-situ testing, instrumentation for field performance studies, case histories. (★3.)

CIV E 684. *Engineering Geology and Terrain Analysis.* □4.0 (First Term, 3-1s-1). Information sources in engineering geology and terrain analysis, elements of the geology of sediments and glacial geology. Glacial and periglacial land forms. Photogeology and airphoto interpretation applied to geotechnical engineering. Case histories based on specific materials and regional problems. (★3.)

CIV E 690. *Advanced Foundation Engineering.* □5.0 (Second Term, 4-1s-1). Theories of lateral pressures. Limit equilibrium methods, elasticity methods, semi-empirical methods. Soil anchors. Design of retaining walls and strutted excavations. Bearing capacity of shallow and deep foundations. Allowable settlement of structures. Analysis of settlement of shallow and deep foundations. Behavior of pile groups. Improvement of soils. Design problems in foundation engineering.(★6.)

CIV E 693. *Foundation Engineering.* □3.0 (First Term, 3-0-0). Brief review of geotechnical fundamentals; consideration of subsurface stratigraphy and its interpretation for foundations of structures. Analysis and settlement of shallow and deep foundations. Earth pressures and retaining structures. Foundation instrumentation, observation, interpretation. Note: This course is designed primarily for students majoring in the field of structures. (★3.)

CIV E 694. *Permafrost Engineering.* □4.0 (Second Term, 3-1s-1). Implications for northern development, extent, engineering classification, thermal regime, ground ice, genesis, site investigations, heat conduction in the ground, properties of frozen soil, thaw consolidation, freezing mechanisms, foundations in frozen ground; slope stability, highways and airfields, pipelines and earth dams in arctic and sub-arctic regions. Prerequisite: CIV E 590 or consent of the Department. (★3.)

CIV E 695. *Soil Structures.* □4.0 (Second Term, 3-1s-1). Stresses in slopes. Limit equilibrium methods of analysis. Landslides in soil. Design of earth dams and embankments. Case histories of earth and rockfill dams. Dam foundations. Soft ground tunnelling. (★3.)

CIV E 696. *Geotechnical Aspects in Highway Engineering.* □3.0 (Second Term, 3-0-0). Terrain analysis for highway design, design and construction of highway embankments, quality control procedures, special treatments for soft foundations of embankments. Behavior of compacted soils under repeated loading, swelling subgrade soils. Admixture stabilization using Portland cement, lime, bituminous materials or other chemicals. (★3.)

CIV E 697. *Rock Engineering.* □4.0 (Second Term, 3-1s-1). Elements of structural geology, analysis of the geometry of rock defects, properties of intact rocks. Properties of rock masses and stresses in rock masses, stability of rock slopes. Rock foundations and underground excavations in rock. Case studies. (★3.)

CIV E 698. *Geotechnical Engineering of Oil Sands Development.* □3.0 (either term, 3-0-0). Origin and distribution of oil sands; surficial geology, geomorphological setting and geology of oil sands deposits in Alberta; regional hydrogeology; material and geotechnical properties, and site investigation practice. Geotechnical engineering in surface mining projects; underground access projects; *in situ* recovery projects; plant site development, and development of infrastructures. Prerequisite: CIV E 693 or equivalent or consent of instructor. (★3.)

CIV E 699. *Advanced Topics in Soil Mechanics.* □3.0 (either term, 3-0-0). (★3.)

CIV E 900. *Non-Thesis Project.* □ 3.0 (No set hours, credit equivalent to a single-term course). Comprehensive problems in Civil Engineering analysis and / or design; preparation of detailed engineering reports. (★3.)

204.16 Classics

204.16.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Classics offers programs leading to the degrees of Master of Arts and Doctor of Philosophy.

(2) The M.A. may be earned in Classics (languages, literatures and history), in Ancient History (and Archaeology, if desired), in Greek, or in Latin.

(3) The Ph.D. may be earned with specialization in Greek literature, Latin literature, Greek history, Roman history, or classical archeology. A doctoral candidate is expected, however, to attain a reasonable over-all competence in the general fields of Classics.

(4) Course requirements, language proficiency, and length of programs for graduate studies in Classics depend to some extent on the student's previous training and on his / her anticipated needs for the chosen area of specialization. The University's minimum requirements are stated elsewhere in the Calendar.

(5) Financial assistance in the form of Graduate Assistantships is available.

(6) Requests for additional information should be addressed to the Chairman, Committee on Graduate Studies, Department of Classics.

204.16.2 GRADUATE COURSES

Classics

THES 000. *Thesis.*

CLASS 521. *Ancient History (Comprehensive).* ★6 (0-3s-0).
CLASS 601. *Studies in Greek Archaeology.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).
CLASS 602. *Studies in Italian Archaeology.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

Greek

GREEK 511. *Greek Grammar and Style.* ★3 (2-0-0; 1-0-1). Note: A single term course offered over the full session.
GREEK 520. *History of the Greek Language I.* ★3 (First Term, 3-0-0). Prerequisite: GREEK 411 or 511 or equivalent.
GREEK 521. *History of the Greek Language II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 520.
GREEK 522. *Greek Epigraphy.* ★3 (either term, 3-0-0).
GREEK 523. *Greek Palaeography.* ★3 (either term, 3-0-0).
GREEK 524. *Hellenistic Poetry.* ★3 (either term, 3-0-0).
GREEK 525. *Hesiod.* ★3 (either term, 3-0-0).
GREEK 526. *Homer I.* ★3 (First Term, 3-0-0).
GREEK 527. *Homer II.* ★3 (Second Term, 3-0-0).
GREEK 528. *Lyric Poetry.* ★3 (either term, 3-0-0).
GREEK 529. *Pindar.* ★3 (either term, 3-0-0).
GREEK 530. *Greek Philosophical Authors I.* ★3 (First Term, 3-0-0).
GREEK 531. *Greek Philosophical Authors II.* ★3 (Second Term, 3-0-0).
GREEK 532. *Greek Tragedy I.* ★3 (First Term, 3-0-0).
GREEK 533. *Greek Tragedy II.* ★3 (Second Term, 3-0-0).
GREEK 534. *Greek Oratory I.* ★3 (First Term, 3-0-0).
GREEK 535. *Greek Oratory II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 534.
GREEK 536. *Greek Historiography I.* ★3 (First Term, 3-0-0).
GREEK 537. *Greek Historiography II.* ★3 (Second Term, 3-0-0).
GREEK 538. *Greek Comedy I.* ★3 (First Term, 3-0-0).
GREEK 539. *Greek Comedy II.* ★3 (Second Term, 3-0-0). Prerequisite: GREEK 538.
GREEK 540. *Koine and Later Authors I.* ★3 (First Term, 3-0-0).
GREEK 541. *Koine and Later Authors II.* ★3 (Second Term, 3-0-0).
GREEK 542. *Studies in Greek Literature I.* ★3 (First Term, 3-0-0).
GREEK 543. *Studies in Greek Literature II.* ★3 (Second Term, 3-0-0).
GREEK 544. *Readings in Greek History I.* ★3 (First Term, 3-0-0).
GREEK 545. *Readings in Greek History II.* ★3 (Second Term, 3-0-0).
GREEK 546. *Readings in Hellenistic History I.* ★3 (First Term, 3-0-0).
GREEK 547. *Readings in Hellenistic History II.* ★3 (Second Term, 3-0-0).
GREEK 598. *Supervised Reading.* ★3 (either term, 3-0-0).
GREEK 599. *Supervised Reading.* ★3 (either term, 3-0-0).
GREEK 642. *Studies in Greek Literature A.* ★3 (either term, 3-0-0).
GREEK 643. *Studies in Greek Literature B.* ★3 (either term, 3-0-0).
GREEK 698. *Conference course.* ★3 (either term, 3-0-0).
GREEK 699. *Conference course.* ★3 (either term, 3-0-0).

Latin

LATIN 511. *Latin Grammar and Style.* ★3 (2-0-0; 1-0-1). Note: A single term course offered over the full session.
LATIN 530. *History of the Latin Language I.* ★3 (First Term, 3-0-0). Prerequisite: LATIN 411 or 511 or equivalent.
LATIN 531. *History of the Latin Language II.* ★3 (Second Term, 3-0-0). Prerequisite: LATIN 530.
LATIN 532. *Latin Epigraphy.* ★3 (either term, 3-0-0).
LATIN 533. *Medieval Latin.* ★3 (either term, 3-0-0). Note: Formerly LATIN 534.
LATIN 534. *Latin Palaeography.* ★3 (either term, 3-0-0). Note: Formerly LATIN 533.
LATIN 535. *Early Roman Poetry.* ★3 (either term, 3-0-0).
LATIN 536. *Vergil I.* ★3 (First Term, 3-0-0).
LATIN 537. *Vergil II.* ★3 (Second Term, 3-0-0).
LATIN 538. *Lucretius.* ★3 (either term, 3-0-0).
LATIN 539. *Roman Philosophical Authors.* ★3 (either term, 3-0-0).
LATIN 540. *Catullus.* ★3 (either term, 3-0-0).
LATIN 541. *Roman Comedy.* ★3 (either term, 3-0-0).
LATIN 542. *Roman Letters.* ★3 (either term, 3-0-0).
LATIN 543. *Roman Satire.* ★3 (either term, 3-0-0).
LATIN 544. *Lyric Poetry.* ★3 (either term, 3-0-0).
LATIN 545. *Elegiac Poetry.* ★3 (either term, 3-0-0).
LATIN 546. *Tacitus I.* ★3 (First Term, 3-0-0).
LATIN 547. *Tacitus II.* ★3 (Second Term, 3-0-0).
LATIN 548. *Cicero I.* ★3 (First Term, 3-0-0).
LATIN 549. *Cicero II.* ★3 (Second Term, 3-0-0).
LATIN 550. *Silver Latin I.* ★3 (First Term, 3-0-0).
LATIN 551. *Silver Latin II.* ★3 (Second Term, 3-0-0).
LATIN 552. *Studies in Latin Literature I.* ★3 (First Term, 3-0-0).
LATIN 553. *Studies in Latin Literature II.* ★3 (Second Term, 3-0-0).
LATIN 554. *Readings in Roman History I.* ★3 (First Term, 3-0-0).
LATIN 555. *Readings in Roman History II.* ★3 (Second Term, 3-0-0).
LATIN 556. *Roman Historiography I.* ★3 (First Term, 3-0-0).
LATIN 557. *Roman Historiography II.* ★3 (Second Term, 3-0-0).
LATIN 558. *Roman Military Authors.* ★3 (either term, 3-0-0).
LATIN 559. *Roman Antiquarians.* ★3 (either term, 3-0-0).
LATIN 598. *Supervised Reading.* ★3 (either term, 3-0-0).
LATIN 599. *Supervised Reading.* ★3 (either term, 3-0-0).
LATIN 621. *Advanced Latin Palaeography.* ★6 (3-0-0). Prerequisite: LATIN 534.
LATIN 652. *Studies in Latin Literature A.* ★3 (either term, 3-0-0).
LATIN 653. *Studies in Latin Literature B.* ★3 (either term, 3-0-0).
LATIN 698. *Conference course.* ★3 (either term, 3-0-0).
LATIN 699. *Conference course.* ★3 (either term, 3-0-0).

204.17 Community Development

204.17.1 THE DEGREES OF M.A.

(1) Candidates enrolled in this program must have a general background in the social sciences and relevant humanities, with special emphasis on senior-level proficiency in economics, sociology, political science, anthropology and social psychology. Most students applying for admission to this program will take an initial year as a qualifying graduate student to bring their general background in the social sciences and relevant humanities at the senior undergraduate level up to the requirements. However, students entering the program with an honors degree in a relevant field or with equivalent preparation in the core areas, can be considered as candidates for the Master's degree.

(2) The Division offers two routes for the M.A. degree, a thesis route and a non-thesis route:

(a) The thesis route: Over the two-year period students will be expected to take the equivalent of at least five and one-half full session courses, three and one-half of which are graduate level courses and more than half of which are mandatory. Students in this route will then write a thesis equivalent to two full-session courses. The mandatory courses form the core of the program and are intended to give the student a definitive and comprehensive view of community development principles and practices. INT D 459 is a prerequisite for all mandatory courses. INT D 559 must be taken in the first year; INT D 601 and INT D 602, must be taken in the second year.

(b) The non-thesis route: Over the two-year period students will be expected to take the equivalent of at least six and one-half full-session courses, four of which are graduate level courses and more than half of which are mandatory. Students in this route will then take INT D 900 which is the non-thesis project.

The balance of each student's program is made up of courses chosen from other Departments and Facul-

ties, depending upon his/her special interests. Areas which are highly recommended include (1) social science research methods (2) adult education (3) group dynamics (4) development and change (relevant courses in economics, rural and urban sociology, education, anthropology, philosophy, and organizational development). Other courses are offered by Geography, History, Political Science, Recreation Administration and Education. Where students' special interests are not met by existing courses, conference (or reading) courses or practicums can be arranged under the supervision of a staff member with some competence in that particular field.

(3) For additional information regarding this program, including the availability of assistantships, students should contact the Director, Division of Community Development, Room 748, Education South Building, The University of Alberta, Edmonton, Alberta. Such inquiries should be made as early as possible, particularly by students who wish to begin acquiring the necessary prerequisites through Spring or Summer Session courses.

204.17.2 GRADUATE COURSES

THES 000. *Thesis.*

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). The history, origins, foundation and definitions of community development. (Registration in this course is handled by the Department of Sociology).

INT D 506. *Community Development Field Methods and Techniques.* ★3 (either term, 3-0-2). Practical training in field methods and techniques related to the principles and practices of Community Development: for example, Strategies of Involvement and Participation, Small Group and Large Group Skills, Program Planning, Community Analysis, The Use of Communications and Mass Media. Prerequisite: Consent of Division.

INT D 509. *Conference Course in Community Development.* ★3 (either term, 3-0-0). Prerequisite: Consent of Division.

INT D 510. *Community Development Practicum.* ★3 (either term, 3-0-0). Prerequisite: Consent of Division.

INT D 516. *Learning in the Community.* ★3 (either term, 3-0-2). An examination of how and what people learn in a community through mass media, institutions and organizations, traditions and customs, popular culture, advertising, etc. The value of information and knowledge in the development of a community will be explored and assessed. Prerequisite: Consent of Division.

INT D 559. *Theories of Community Development.* ★3 (either term, 3-0-0). A study of the major theories of Community Development with respect to their philosophy and their methodology, and the relative merits of various approaches to Community Development. Prerequisite: INT D 459 or equivalent.

INT D 601. *Comparative Community Development.* ★3 (First Term, 3-0-0). A detailed study of the application of community development theories in specific projects; a survey and evaluation of representative programs in community development in Canada and elsewhere. Prerequisite: INT D 459 or equivalent.

INT D 602. *Current Issues in Community Development.* ★3 (Second Term, 3-0-0). An examination of current social problems and their relevance to community development theory and practice; the relevance to community development approaches to contemporary community development problems. Prerequisite: INT D 459 or equivalent.

INT D 900. *Non-Thesis Project.* ★3 (variable). Note: for Community Development students enrolled in a non-thesis M.A. Program. Prerequisite: Consent of Division.

204.18 Community Medicine

The Master of Health Services Administration program is acceptable to the Council of the Royal College of Physicians and Surgeons of Canada as a portion of the specialty training program in Community Medicine. See Section 204.39.

204.19 Comparative Literature

204.19.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Comparative Literature offers programs leading towards the degrees of Master of Arts and Doctor of Philosophy in all literatures taught at this University.

(2) Applicants for graduate work in Comparative Literature should, in their previous programs, have concentrated on the literature of one or two languages (combined honors). They must have a competent reading knowledge of at least one language other than English (for native English speakers) or French (for native French speakers) in order to undertake an M.A. program, and of at least two languages other than English (for native English speakers) or French (for native French speakers) in order to undertake a Ph.D. program.

(3) In addition to the thesis, four courses are normally required for an M.A. and six additional courses for a Ph.D. The number of courses and their areas shall be determined individually. The Ph.D. candidacy examination consists of a departmental examination (the description of which is available in the department) and the oral (as described under § 203.2(6)).

(4) A candidate for the M.A. entering from a four-year specialized program and continuing work in the same field, is normally required to complete the equivalent of one calendar year's work. Other candidates are normally required to complete the equivalent of two years' work.

(5) The time necessary to complete the requirements for the Ph.D. depends upon the student's progress. For a student with a B.A., the minimum requirement is three academic years of study and research, of which two academic years must be in residence at The University of Alberta. For a student with an M.A., the minimum requirement is two years of study and research in residence at The University of Alberta. Details are determined by the Department, and an alternative method of meeting the residence requirement may be considered on recommendation of the Department to the Faculty of Graduate Studies and Research.

(6) Graduate Assistantships, tenable in the department corresponding to the language in which the student has specialized; scholarships, fellowships, and bursaries are available to qualified students. For details, see the Awards section of the Calendar.

(7) Enquiries concerning academic programs should be addressed to the Chairman of the Department.

204.19.2 GRADUATE COURSES

THES 000. *Thesis.*

C LIT 500. *Literary Scholarship: Methods and Techniques.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 504. *Studies in the Relationship of Literature with the Visual Arts.* ★3 (either term, 3-0-0).

C LIT 505. *The Theory of the Study of Literature.* ★3 (either term 3-0-0) or ★6 (3-0-0).

C LIT 507. *Literary Stylistics.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 510. *Poetics: The Nature and Forms of Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 511. *Comparative Studies in "Formalistic" Approaches to Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 512. *Theory of Translation.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 514. *Poetry and Oral Tradition.* ★3 (either term, 3-0-0).

C LIT 515. *Studies in Folklore: Prose Forms.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 516. *Studies in Folklore: Poetic Forms.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 517. *The Greek and Latin Tradition in European Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 518. *The Biblical Tradition in Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 519. *Comparative Studies in the Asian and Western Tradition.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 520. *Comparative Studies in Medieval Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 529. *Studies in Renaissance Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 530. *Comparative Studies in European Drama of the Sixteenth and Seventeenth Centuries.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 545. *Comparative Studies in Eighteenth Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 550. *Comparative Studies in Romantic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 552. *Comparative Studies in Realistic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 553. *Comparative Studies in Naturalistic Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 554. *Comparative Studies in the Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 555. *Comparative Studies in Literature of the Late Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 556. *Advanced Comparative Studies in Traditional and Post-Colonial Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 560. *Comparative Studies in Canadian Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 565. *Comparative Studies in the Epic.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 567. *The Romance.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 568. *Comparative Studies in the Pastoral.* ★3 (either term, 3-0-0).

C LIT 570. *Comparative Studies in Comedy.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 575. *Tragedy: A Theoretical Approach.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 580. *Comparative Studies in Literary Parody.* ★3 (either term, 3-0-0).

C LIT 585. *Studies of Forms and Genres.* ★3 (either term, 3-0-0), or ★6 (3-0-0).

C LIT 590. *Studies of Motifs and Themes.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 595. *Special Topics in Comparative Literary History.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 599. *Tutorial.* ★0 (2-0-0).

C LIT 609. *Special Topics in Asian Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 610. *Special Topics in Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 611. *Marxist Literary Theory and Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 612. *Marxist Concepts of Literature in the XXth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 628. *Comparative Studies in the Renaissance and Baroque Literature of Italy, Spain, and France, and Counterparts in England.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 638. *Avant-garde Trends in XXth Century Slavic and Western Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 640. *Socialist Realism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 641. *Surrealism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 642. *Literary Existentialism: Theory and Practice.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 645. *Comparative Studies in Twentieth-Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 646. *Comparative Studies in Modern Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 648. *Comparative Studies in French and English Literature, 1830-1900.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 649. *Franco-German Literary Relations during the Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 695. *Anglo-German Literary Relations from the Sixteenth to the Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

C LIT 696. *Seminar Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

C LIT 697. *Special Reading Course I.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

C LIT 698. *Special Reading Course II.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

C LIT 699. *Conference Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

204.20 Computing Science

204.20.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Computing Science Department offers programs leading to the degrees of Master of Science and Doctor of Philosophy in a number of fields, including automata and switching theory, artificial intelligence, data base management, graphical communication, information retrieval, minicomputers, numerical analysis, operating systems, programming languages, simulation studies, statistical analysis, symbolic manipulation, theory of computation. Most traditional and instructional computing is done on the University's Amdahl 470, operating under Michigan Terminal System (MTS). The system supports a large number and variety of remote terminals. The department has its own computing laboratory, which contains a variety of minicomputers as well as a PDP 11/60 system (used for picture processing and data base management research), a PDP 11/45 system (for virtual memory and multiprogramming studies), and a microprogrammable Nanodata QM1.

(2) Candidates for the M.Sc. degree in Computing Science are to have an Honors degree or the equivalent, from a recognized university, with a background in computing science and mathematics at least equivalent to the Computing Science and Mathematics courses required in the first three years of the Honors Program in Computing Science at the University of Alberta. A student who does not meet these requirements will be required to take course work additional to that contained in his M.Sc. Program, either concurrently with his graduate program or in a year of study prior to admission as an M.Sc. candidate.

(3) After acceptance into the M.Sc. Program, candidates will be required to take a minimum of six single-term graduate courses and write a thesis or to take a minimum of eight single-term graduate courses and complete a project. The program may normally be completed in about 18 months of continuous study.

(4) To be admitted as a provisional candidate for the Ph.D., a student must normally have an M.Sc. degree in Computing Science or a related field. Unusually qualified applicants having the equivalent of a first-class honors B.Sc. degree may be admitted directly into the Ph.D. program; such students will be required to complete a minimum of six single-term graduate courses in addition to the requirements in (5).

(5) The Ph.D. candidate will be required to take a minimum of six single-term graduate courses and pass the departmental comprehensive examinations. The major part of the student's program will consist of original research, the results of which will be contained in the doctoral thesis.

(6) Students in all degree programs will be expected

to satisfy the requirements currently in force with respect to attendance at departmental colloquia and seminars and public presentation of the student's research results.

(7) Financial assistance is available throughout the calendar year in the form of Graduate Assistantships, and Research Grant Assistantships.

(8) Further information may be obtained from the Chairman, Graduate Committee, Department of Computing Science.

204.20.2 UNDERGRADUATE COURSES

Students entering the graduate program are expected to have a background equivalent to that provided by the following Computing Science courses.

CMPUT 414. *Programming Languages.* ★3 (First Term, 3-0-1). Formal definition of programming languages; introduction to syntax analysis; properties of algorithmic languages; list processing languages; run-time representation of program and data structures. Prerequisite: CMPUT 314/315 or 364/365.

CMPUT 416. *Systems Programming.* ★3 (Second Term, 3-0-2). Detailed study of assembler language facilities under a large scale operating system; data management; task management; job management; loading and subroutine linkage; input-output and channel programming and hardware. Prerequisite: CMPUT 314/315 or 364/365.

CMPUT 418. *Numerical Analysis I.* ★3 (First Term, 3-0-0). Numerical methods for determining eigenvalues and eigenvectors; Gerschgorin's theorem; Jacobi's method; Given's methods; Householder's method. Review of Gauss-Seidel and point Jacobi methods; successive over relaxation methods; estimation of optimal relaxation parameters. Orthogonal polynomials; spline approximations; trigonometric approximations; gradient methods and directed search. Prerequisites: CMPUT 316, MATH 303 or 308.

CMPUT 462. *Switching Theory and Logical Design.* ★3 (Second Term, 3-0-3). Codes; synthesis of gate networks; simplification of combinatorial networks; fault detection; reliability; threshold logic; synchronous and asynchronous sequential machines; minimization. Prerequisite: CMPUT 315 or 365, or equivalent.

CMPUT 464. *Introduction to Adaptive Systems.* ★3 (First Term, 3-0-0). Finite and infinite automata; information theory; brain models and genetic systems; introduction to artificial intelligence. Prerequisite: CMPUT 314 or 364.

CMPUT 472. *Theory of Computation I.* ★3 (First Term, 3-0-0). Effective procedures; simple programming languages; computable functions; recursive functions; Turing machines; semi-computable predicates; computing science — its definition and development. Prerequisite: CMPUT 314 or 364.

204.20.3 GRADUATE COURSES

THES 000. *Thesis.*

CMPUT 501. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 502. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 503. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 504. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 505. *Analysis of Algorithms.* ★3 (Second Term, 3-0-0). Topics selected from: Models of computation. Design of efficient algorithms. Sorting and order statistics. Data structures for set manipulation problems. Algorithms on graphs. Matrix multiplications and related operations. The fast Fourier transform and its applications. Pattern matching algorithms. NP complete problems and approximation algorithms. Prerequisite: Graduate Standing or Honors students with CMPUT 472. Note: All graduate students are required to obtain credit in this course.

CMPUT 506. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 507. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 508. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 509. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 511. *Computer Graphics.* ★3 (First Term, 3-0-0). Plotters, graphical displays and picture scanners; encoding methods for graphical data; compound data structures and graphical list processors; current attempts at picture grammars. Prerequisite: CMPUT 315 or 365 or consent of the Department.

CMPUT 512. *Minicomputer Systems and Architectures.* ★3 (Second Term, 3-0-3). Advanced minicomputer projects course involving the following: minicomputer interface design, construction, and programming. Computer network design and protocol specification. Microprogramming and emulation. Diagnostic techniques. Minicomputer systems design and applications. Prerequisites: CMPUT 365 or 412, and 462.

CMPUT 516. *Computer Systems I.* ★3 (First Term, 3-0-0). Evaluation and comparison of computer systems, with emphasis on virtual memory and hierarchical memory techniques. Prerequisite: CMPUT 416, or equivalent systems programming experience.

CMPUT 517. *Computer Systems II.* ★3 (Second Term, 3-0-0). The study of operating system practices and techniques via a term project. Prerequisite: CMPUT 516.

CMPUT 518. *Matrix Computations I.* ★3 (First Term, 3-0-0). Elimination methods; roundoff analysis and conditioning; norms; a posteriori error bounds; iterative methods for solving large-scale linear systems; practical implementation of algorithms; comparison of methods. Prerequisite: CMPUT 419.

CMPUT 519. *Matrix Computations II.* ★3 (Second Term, 3-0-0). Error analyses of methods and finding eigenvalues and eigenvectors of symmetric matrices; norms; a posteriori error bounds; perturbation theory of eigenvalues; practical assessment of answers; QR and LR algorithms; shift of origin techniques. Prerequisite: CMPUT 419.

CMPUT 521. *Time Series Analysis I.* ★3 (First Term, 3-0-0). Classification of random processes; stationarity; imbedded Markov chains; generating functions; Laplace transforms of distribution functions; priority and nonpriority queueing systems; scheduling algorithms; applications primarily pertaining to computer systems and communication networks. Prerequisites: CMPUT 316 and 322 or consent of the Department. Offered alternate years with CMPUT 522.

CMPUT 522. *Time Series Analysis II.* ★3 (First Term, 3-0-0). Time series models for computer systems; samples of computer system observations; analysis and estimation of autocovariance and autocorrelation functions; time series models are developed from real data; hence, emphasis is on data analysis and model building for real-life applications. Prerequisites: CMPUT 316 and 322 or consent of the Department. Offered alternate years with CMPUT 521.

CMPUT 525. *Formal Syntax Analysis.* ★3 (First Term, 3-0-0). Context-free grammars and other formalisms for describing syntax of programming languages. Regular grammars and finite state automata. Top-down and bottom-up parsing of context-free languages. Early's context-free parser. Precedence, LL(k), and LR(k) grammars. SLR(k), LALR(k), L(m)R(k) and LR(k) parsing techniques. Transduction grammars. Problems of imbedding parsers into compilers. Error-recovery techniques. Prerequisite: CMPUT 415, or consent of the Department.

CMPUT 530. *Advanced Compiler Construction.* ★3 (First Term, 3-0-0). Memory allocation for object programs, stacks and free-storage disciplines, garbage collection; parameter mechanisms; general compiler organization; symbol tables; code generation; global and peephole optimization techniques; compile-time and run-time diagnostic facilities. Prerequisite: CMPUT 525, or consent of the Department.

CMPUT 551. *Artificial Intelligence I.* ★3 (First Term, 3-0-0). LISP; typology of problems and games, algorithms for state-space and problem-reduction search, deductive problem-solving and question-answering, plan formation and generalization, higher-level planning, planning languages, skill acquisition, program synthesis, representing prodedural and declarative knowledge, hierarchies, production systems, expert systems, control issues. Prerequisite: CMPUT 464 or consent of the Department.

CMPUT 552. *Artificial Intelligence II.* ★3 (Second Term, 3-0-0). Computational methods of scene analysis, making analogies and forming concepts, introduction to philosophy of language;

and computational linguistics, early work and fundamental problems in language understanding, the work of Winograd, Woods, Schank and his associates, Wilks, Marcus, and others, natural language data base access, speech processing. Prerequisite: CMPUT 551.

CMPUT 555. *Computing in Biological Systems.* ★3 (Second Term, 3-0-0). An introduction to biological mechanisms of information processing, memory, adaptation and learning with emphasis on genetic and neural systems; modelling and simulation of biological systems. Prerequisite: CMPUT 464 or consent of the Department.

CMPUT 565. *Data Structures.* ★3 (Second Term, 3-0-0). Advanced data structures and algorithms for manipulating them. In particular, binary trees, balanced trees and B-trees will be discussed in depth. Languages for processing lists and trees; applications to sorting and searching. Prerequisite: CMPUT 414.

CMPUT 566. *Algebraic and Symbolic Manipulation.* ★3 (Second Term, 3-0-0). Representation of expressions; simplification; symbolic languages; multiple-precision arithmetic; fast Fourier transforms; modular arithmetic; Chinese remainder and interpolation algorithms; greatest common divisor algorithms; multivariate systems of equations; polynomial resultants; rational function manipulation, sequence prediction; automatic differentiation and integration. Prerequisites: CMPUT 314 or 364 and MATH 282 or 328. Corequisites: MATH 416 or 425.

CMPUT 571. *Sequential Machines.* ★3 (Second Term, 3-0-0). Characterization and representation of finite state automata; state and machine equivalence; analysis and synthesis; state assignment; decomposition; feedback and errors; identification, introduction to linear machines and feedback shift registers. Prerequisite: CMPUT 462 or 464.

CMPUT 572. *Theory of Computation II.* ★3 (Second Term, 3-0-0). Primitive recursive functions, Turing machines recursive functions, unsolvable problems, recursive and recursively enumerable sets, reducibility, space and time complexities, time and space hierarchies, machine independent theory of complexity, NP-complete problems. Prerequisite: CMPUT 464 or 472 or consent of the Department.

CMPUT 591. *Information Storage and Retrieval I.* ★3 (First Term, 3-0-0). The basic problems and terminology of information storage and retrieval. Sequential, chained, inverted, computed-access, and clustered files. Automatic content analysis of texts. Classification techniques. Construction of thesauri based on co-occurrences and pseudo-classification. Polynomial complete problems. Prerequisites: CMPUT 314/315 or 364/365 or equivalent.

CMPUT 592. *Data Base Management.* ★3 (Second Term, 3-0-0). Relational, network and hierarchical data models; sequential, indexed sequential, inverted, multi-lists, computed access and cluster files; external sorting algorithms; secondary indices optimization; security; decomposition of query; differential files; evaluation of file organizations; current literature. Prerequisite: CMPUT 417 or consent of the instructor.

CMPUT 618. *Ordinary Differential Equations.* ★3 (First Term, 3-0-0).

CMPUT 619. *Partial Differential Equations.* ★3 (Second Term, 3-0-0).

CMPUT 651. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 652. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 653. *Topics in Computing Science.* ★3 (First Term, 3-0-0).

CMPUT 654. *Topics in Computing Science.* ★3 (Second Term, 3-0-0).

CMPUT 660. *Seminar on Computer Systems Evaluation.* ★3 (First Term, 3-0-0).

CMPUT 661. *Seminar on Software Engineering.* ★3 (Second Term, 3-0-0).

CMPUT 662. *Advanced Topics in Sequential Machines.* ★3 (Second Term, 3-0-0).

CMPUT 663. *Advanced Topics in Automata and Computability.* ★3 (First Term, 3-0-0).

CMPUT 665. *Seminar in Artificial Intelligence.* ★3 (Second Term, 3-0-0).

CMPUT 666. *Seminar in Adaptive Systems.* ★3 (First Term, 3-0-0).

CMPUT 670. *Coding and Storage in Information Retrieval.* ★3 (First Term, 3-0-0).

CMPUT 671. *Classification Problems in Information Retrieval.* ★3 (Second Term, 3-0-0).

CMPUT 900. *Non-Thesis Project.* ★3 (variable).

204.21 Dentistry

204.21.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Faculty of Dentistry has research laboratories and instructional facilities for a limited number of graduate students proceeding to the Master of Science degree in clinical science or to the Master of Science degree in basic science (Oral Biology). In addition the Division of Oral Biology offers programs leading to the Doctor of Philosophy degree.

(2) Dental graduates may undertake graduate programs in either oral biology or clinical science. Students without dental qualifications holding a B.Sc. degree in biological physical science are eligible for graduate study in oral biology. Normally, science students accepted into the Ph.D. program in Oral Biology will hold the equivalent of a four year (Honors) B.Sc.

(3) The research interests of the staff include: *Anatomy* — human growth and development, embryonic induction of dental tissues and organs, evolution of dentitions; *Biochemistry* — structure crosslinking of collagen and elastin. Calcification.; *Oral Pathology* — immunology and oral tumors, pulp capping agents; *Physiology* — neuro-muscular function; *Public Health and Community Dentistry* — health care, delivery systems, administration of public health programs; *Clinical Dentistry* — problems in Orthodontic diagnosis and treatment. *Dental Materials* — fluoride, etching of dental porcelain, physical properties of dentin, evaluations of impression material and tooth desensitizing pastes.

(4) Fellowships and assistantships are available. Applications may be submitted to the Chairman, Division of Research and Graduate Studies.

(5) More detailed information may be obtained from the Chairman, Division of Research and Graduate Studies.

204.21.2 GRADUATE COURSES

THES 000. *Thesis.*

DENT 500. *Cephalometrics.* ★5 (First Term, 0-3s-3). Measurements of cranial and jaw relationships by radiographic techniques.

DENT 501. *Advanced Pedodontics.* ★11 (1-9c-0). Theory and practice of clinical pedodontics with emphasis on the treatment of chronically ill and handicapped children. Taken in the first year of a graduate program in Pedodontic dentistry.

DENT 502. *Advanced Oral Pathology.* ★3 (First Term, 3-0-0). A review of diseases which affect the oral tissues and exploration of recent additions to knowledge pertaining to them.

DENT 503. *Mineralization in Biological Systems.* ★3 (First Term, 3-0-0). The developmental morphology and the chemical nature of the protein and mineral phases of calcified tissues in man and animals with particular emphasis on teeth and bones.

DENT 504. *Oral Biology (Applied Anatomy).* ★3 (First Term, 3-0-0). Consideration of Developmental and Gross Anatomy related to the appreciation and practice of Dentistry.

DENT 505. *Dental Biochemistry and Physiology.* ★2 (Second Term, 2-0-0).

DENT 506. *Oral Medicine.* ★3 (Second Term, 3-0-0). A study of the mechanisms of oral disease as a basis for rationale of treatment.

DENT 507. *Research Methodology.* ★1 (Second Term, 1-0-0). Reading assignments and the preparation of a detailed plan for a research project and its defense.

DENT 510. *Recent Advances in Oral Medicine.* ★1 (First Term, 1-0-0). In a series of fourteen lectures the current status of Oral Medicine — Oral Pathology is reviewed. The emphasis is on an application of new knowledge to the diagnosis and management of dental and paradental disease processes in adolescents.

DENT 540. *Advanced Complete Denture Prosthodontics.* ★11 (1-0-9). A comparison and evaluation of the various methods of rehabilitation of edentulous patients.

DENT 541. *Advanced Removable Partial Denture Prosthodontics.* ★8 (1-0-6). The oral rehabilitation of partially edentulous patients by the designing and construction of removable prosthesis.

DENT 550. *Clinical Orthodontics.* ★17 (1-3c-0; 6-18c-0). A course designed to give the student the clinical training necessary to treat orthodontic problems. The edgewise technique is the basic system taught in the clinical program.

DENT 551. *Orthodontic Technique.* ★6 (First Term, 1-0-9). Lectures on the biomechanical principles involved in orthodontic tooth movement. The laboratory entails advanced techniques to teach the student the skills and methods of manipulating orthodontic materials and fabricating the appliances required to treat orthodontic clinical problems.

DENT 552. *Orthodontic Seminar.* ★4 (Second Term, 0-4s-0). Orthodontic theory including etiology and diagnosis of malocclusion, treatment planning and philosophy of treatment techniques.

DENT 553. *Craniofacial Growth and Development.* ★2 (Second Term, 0-2s-0). A detailed review of the postnatal growth and development of human craniofacial structures. This course involves an analysis of the cephalometric and growth studies especially related to the practice of orthodontics.

DENT 554. *Functional Occlusion.* ★3 (Second Term, 3-0-0). Designed to give the student an understanding of normal and abnormal occlusion and laboratory and clinical experience in occlusal adjustment.

DENT 555. *Dental Materials.* ★2 (First Term, 2-0-0). Covers the structure, properties and testing methods relative to dental materials. Specific materials and the clinical and biological significance of their properties will be discussed.

DENT 556. *Orthodontic Diagnosis and Treatment Planning.* ★3 (First Term, 3-0-0). A course designed to develop in the student the creative ability and critical analysis necessary to diagnose orthodontic problems and to treatment plan clinical cases. Limitations to orthodontic therapy will be emphasized during treatment planning.

DENT 557. *Clinical Orthodontics.* ★6 (6-18c-0). A continuation of DENT 550 for students in the first year of the graduate orthondontic program. A course designed to give the student the clinical training necessary to treat orthodontic problems.

DENT 558. *Orthodontic Seminar.* ★3 (0-3s-0). A continuation of DENT 552 for students in the first year of the graduate program. A course in orthodontic theory.

DENT 601. *Advanced Pedodontics.* ★11 (1-0-9). A continuation of DENT 501 taken in the second year of a graduate program in Pedodontic dentistry.

DENT 640. *Advanced Complete Denture Prosthodontics.* ★11 (1-0-9). The diagnosis and treatment planning for edentulous patients whose difficulties are complicated by abnormal oral or systemic conditions.

DENT 641. *Advanced Removable Partial Denture Prosthodontics.* ★8 (1-0-6). The restoration of abutment teeth by full coverage and the role of precision and semi-precision attachments as they relate to a removable prosthesis.

DENT 643. *Maxillofacial and Surgical Prosthetics.* ★3 (First Term, 1-0-3). A study of the methods of rehabilitation of patients who have lost various parts of the face or jaws by accident or disease.

DENT 650. *Clinical Orthodontics.* ★24 (6-18c-0; 0-18c-0). A continuation of DENT 550 for students in the second year of a post-graduate program.

DENT 652. *Advanced Orthodontic Seminar.* ★10 (0-4s-0; 0-6s-0). This course is a continuation of DENT 552.

DENT 657. *Clinical Orthodontics.* ★6 (0-18c-0). A continuation of DENT 650 for students in the second year of the graduate orthodontic program. A course designed to give the student the clinical training necessary to treat orthodontic problems.

DENT 658. *Orthodontic Seminar.* ★3 (0-3s-0). A continuation of DENT 652 for students in the second year of the graduate program. An advanced course in orthodontic theory.

204.22 Drama

204.22.1 GENERAL INFORMATION

(1) The Department offers graduate programs leading to the Master of Fine Arts degree in Design, Directing or Playwriting and to the Master of Arts degree in Dramatic Literature, Theatre History, Dramatic Theory and Criticism or Dramaturgy.

(2) The Department provides one fully-equipped Studio Theatre and three experimental theatre facilities as dramatic arts laboratories available to graduate students. Two workshops each for costume design and set design serve graduate designers. The theatre collection in the library is extensive; it offers particular opportunities for work in Expressionism, German, French, and Spanish Drama, and possesses one of the largest collections anywhere of research materials on Canadian Theatre.

(3) The aim of the M.F.A. programs is to train candidates to a level of competency sufficient to enter the profession.

The M.A. programs, essentially research oriented, also offer training in Dramaturgy as one of the means by which candidates may be actively involved in the creative pursuits of the department.

(4) Graduate Assistantships are available to qualified students. In addition summer assistantships to the value of $1,000 are available to selected candidates for work on thesis projects.

(5) Inquiries should be addressed to the Chairman, Graduate Committee, Department of Drama.

204.22.2 THE DEGREE OF M.F.A.

(1) A candidate must normally hold a four year undergraduate degree in theatre studies. Consideration will be given to outstanding applicants with different qualifications.

(2) Numerous practical theatre credits are required in the applicant's intended area of specialization along with letters of recommendation on the applicant's professional promise.

(3) Between the academic and the artistic requirements, candidates must: demonstrate a fundamental knowledge of the components of theatre art — acting, design, directing and playwriting; have extensive training and experience in the area of their intended specialization; and possess sufficient preparation in dramatic literature, theatre history and theatre aesthetics.

(4) The M.F.A. is a program requiring a minimum of two full years of courses.

(5) An acceptable creative thesis project must be presented in performance.

(6) Interested applicants should write for further application details as they relate to their intended area of specialization.

204.22.3 THE DEGREE OF M.A.

(1) A candidate must hold a Bachelor's degree (or its equivalent) from a recognized institution.

(2) To be accepted, the candidate must demonstrate to the Department familiarity with the artistic and practical components of theatre art, as well as sufficient preparation in theatre history and criticism.

(3) Candidates will be given Diagnostic Examinations. These examinations will be sent to any institution the candidate may designate. The results of these examinations will serve as a basis for adjusting programs to individual needs.

(4) The program normally requires two years of study. In exceptional cases, candidates may be admitted to the second year of the program and complete their studies in one year accordingly. Those who need to make up prerequisite training may be required to enter a qualifying year.

(5) Candidates will be required to pass a comprehensive examination. They must present an acceptable thesis and defend it orally.

(6) Candidates must demonstrate a reading knowledge of one approved language other than English.

204.22.4 GRADUATE COURSES

THES 000. *Thesis.*

DRAMA 500. *Theatre Aesthetics.* ★6 (3-0-0). A study of problems in dramatic theory and criticism as related to the evolution of modern theatre aesthetics. Prerequisite: Consent of the Department.

DRAMA 601. *Methods and Tools of Research.* ★3 (First Term, 3-0-0).

DRAMA 604. *Research in Theatre History.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

DRAMA 605. *Special Projects in Theatre.* ★3 (either term, 1-0-4). Prerequisite: Consent of the Department.

DRAMA 607. *Dramaturgy I.* ★3 (either term, 3-0-0).

DRAMA 608. *Research Seminar.* ★6 (0-3s-0). Research in selected topics. (formerly part of DRAMA 602).

DRAMA 610. *Applied Criticism.* ★3 (3-0-0).

DRAMA 611. *Graduate Seminar.* ★0. A non-credit course compulsory for M.A. (Drama) candidates and open to others.

DRAMA 616. *Research in Canadian Drama.* ★6 (3-0-0). Note: Formerly part of DRAMA 606.

DRAMA 618. *Advanced Research Seminar.* ★6 (0-3s-0). Advanced research in selected topics. Prerequisite: DRAMA 608 or consent of the Department.

DRAMA 660. *Playwriting Projects.* ★6 (0-0-3). Prerequisite: Consent of the Department.

DRAMA 661. *Advanced Playwriting Projects.* ★6 (0-0-3).

DRAMA 670. *Styles in Total Design.* ★6 (0-6L-0). Note: Restricted to M.F.A. (Drama) students.

DRAMA 671. *Advanced Theatre Design.* ★6 (0-6L-0). Note: Restricted to M.F.A. (Drama) students.

DRAMA 672. *Design for Directors.* ★6 (0-4L-0). Co-requisites: DRAMA 660, 661, 680 or 681. Note: Resitricted to M.F.A. (Drama) students.

DRAMA 680. *Styles in Directing.* ★6 (0-3s-6). Note: Restricted to M.F.A. (Drama) students.

DRAMA 681. *Advanced Projects in Directing.* ★6 (0-3s-6). Note: Restricted to M.F.A. (Drama) students.

DRAMA 695. *Seminar in Theatre Aesthetics.* ★6 (0-3s-0). Prerequiste: Consent of the Department.

204.23 East European Studies

204.23.1 THE DEGREES OF M.A., M.ED., AND PH.D. WITH THE NOTATION OF SPECIALIZATION IN EAST EUROPEAN AND SOVIET STUDIES.

(1) The Division of East European Studies coordinates interdisciplinary programs and courses dealing with Eastern Europe, the Soviet Union, and East European peoples in Canada.

(2) The Departments participating in offering graduate programs leading to the notation of specialization in East European and Soviet Studies are Comparative Literature, Economics, Educational Foundations, Educational Psychology, Geography, History, Physical Education, Political Science, Slavic Languages, and Sociology.

(3) The basic graduate program at the Master's level consists of area-related study in a Department, the interdisciplinary seminar on East European and Soviet Studies (INT D 546), and a thesis on Eastern Europe, the Soviet Union, or East Europeans in Canada. The student must demonstrate competence in one of the languages of the area to the satisfaction of the Division. Unless waived on the basis of previous study or background, students are also required to include in their program an area-related full course or two half-courses from another Department.

(4) Application for Admission to the Master's program with the specialization should be made to the Faculty of Graduate Studies and Research.

(5) Signatures for the Division and for the participating Department are required on the recommendation of admission, the study program, the notice of oral examination, and the report of the final examining committee. See § 203.1.2 (6).

(6) The Division and a participating Department shall agree to the nature of the student's program of study, including the specification of course requirements, by joint signing of the program form. Similar agreement with respect to general departmental requirements and comprehensive examinations shall be placed in the student's file.

(7) Supervisory committees must include one member from the Division and one from the participating Department. These shall not be the same person. For examining committees an additional person shall be added who is neither a member of the Division nor from the Department participating in the student's program.

(8) Applications for programs at the Doctoral level will be considered. Such applications are subject to agreement between the Division and a participating department, and have the approval of the Dean of the Faculty of Graduate Studies and Research.

(9) A number of Graduate Assistantships are available through the Division and through participating Departments.

(10) Graduate students in western Canadian universities can be admitted to the Division as exchange graduate students.

(11) Inquiries should be addressed to the Director, Division of East European Studies 300 Athbasca Hall, University of Alberta, T6G 2E8.

204.23.2 GRADUATE COURSES

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar. (Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology).

204.24 Economics

204.24.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Economics offers programs leading to the Master of Arts and Doctor of Philosophy degrees. The M.A. degree may be taken by either the thesis route or the non-thesis route.

(2) Students entering the graduate program are required to have or to make up credit in a basic course in Calculus and one in Statistics in addition to their normal graduate program.

(3) The Department automatically considers all applicants for graduate teaching and research assistantships. To ensure consideration the application must be received by the Department before March 1. Applications received after that date will be considered for assistantships only if funds are still available. Details of scholarships and other financial assistance available are included in the Awards section of this Calendar.

(4) Except in special cases, no language other than English is required.

(5) Inquiries regarding details of programs offered within the Department should be directed to the Chairman of the Department.

NOTE: Those interested in a part-time pursuit of the M.A. in Economics are encouraged to contact the Department regarding special arrangements that might be made to enable them to begin their program as special students with the possibility of a transfer to the M.A. (thesis) program later on depending upon the discretion of the Department.

204.24.2 GRADUATE COURSES

THES 000. *Thesis.*

ECON 501. *History of Economic Thought.* ★3 (either term, 3-0-0). A survey of economic thought from Adam Smith to modern times, with particular attention to the theories of economic development and growth.

ECON 503. *Microeconomic Theory I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482 and ECON 486/487 or corequisite ECON 597.

ECON 505. *Microeconomic Theory II.* ★3 (either term, 3-0-0). Prerequisites: ECON 503, 597 or equivalent.

ECON 507. *Econometrics I.* ★3 (First Term, 3-0-0). Statistical inference in economics. Probability and distribution theory including transformation of random variables and the multivariate normal. Estimation, including maximum likelihood methods. Tests of hypothesis including likelihood ratio tests. Prerequisites: ECON 395/396 or equivalent; MATH 202/221; corequisite: ECON 486.

ECON 508. *Econometrics II.* ★3 (Second Term, 3-0-0). Single equation methods and problems. The general linear model, Aitken's generalization and associated problems, distributed lags, forecasting. Prerequisite: ECON 507 or equivalent.

ECON 509. *Econometrics III.* ★3 (either term, 3-0-0). Simultaneous equation methods and problems. The identification problem, simultaneous equation estimators and their properties. Forecasting and simulation with estimated structures. Prerequisite: ECON 507 or equivalent; corequisite: ECON 508.

ECON 512. *Economic Development I.* ★3 (either term, 3-0-0). The techniques of development planning; qualitative and quantitative problems associated with the drafting and implementation of plans and programs; assessment of internal and external resources available for development and problems of measurement and mobilization of resources.

ECON 513. *Economic Development II.* ★3 (either term, 3-0-0). Economic policy alternatives in a context of growth and development; problems of inflation, balance of payments, disequilibrium, concentration of growth effects; the role of international aid and other external measures.

ECON 514. *Economic Development of Canada I.* ★3 (either term, 3-0-0). A selective analysis of historical factors involved in the economic growth and development of Canada. Consideration focused on strategies of resource involvement, especially human resources. Selected studies of regional development patterns.

ECON 515. *Economic Development of Canada II.* ★3 (either term, 3-0-0). Analysis of modern problems of economic growth and development in the Canadian economy. Consideration of the possibilities of further development that are contained in current policies of governments and in private sectors of the economy. Prerequisite: ECON 514.

ECON 521. *International Economics I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482; ECON 421/422 recommended.

ECON 522. *International Economics II.* ★3 (either term, 3-0-0).

ECON 523. *The International Economy.* ★3 (either term, 3-0-0). Balance of payments, foreign exchange markets, foreign investment, trade and commercial policy, international economic institutions. Note: Designed for graduate students whose specialization is not economics.

ECON 531. *Labor Economics I.* ★3 (either term, 3-0-0). Factors influencing the supply of, and demand for, labor services and the process of relative wage determination in the long-run and the short-run. Determination of money wage levels, aggregate labor-force participation, and the level and structure of aggregate employment and unemployment.

ECON 532. *Labor Economics II.* ★3 (either term, 3-0-0). Topics in manpower and human resource development economics. The role of human resources in economic growth, human resources veiwed as capital, problems and policies in planning, forecasting, and utilizing manpower contexts, methods of evaluating specific manpower programs and projects; and relationships between poverty and manpower utilization.

ECON 540. *Monetary Economics I.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482.

ECON 541. *Monetary Economics II.* ★3 (either term, 3-0-0). Activities of financial intermediaries; evaluation of the effectiveness and the impact of monetary policy in both closed and open systems.

ECON 550. *Public Expenditure.* ★3 (either term, 3-0-0). The theory of the role of the public sector in a market economy; market failures, income distribution, evaluation of public investment, public choice, and the economic theory of federalism. Prerequisites: Introductory, and preferably intermediate, economic theory, and elementary calculus, or permission of instructor.

ECON 551. *The Canadian Public Economy.* ★3 (either term 3-0-0). The economic objectives and growth of the Canadian public sector with emphasis on budgetary processes, intergovernmental fiscal relations and public policy problems and achievements. Note: This course is designed to be of interest to graduate students from other departments.

ECON 552. *Urban Economics.* ★3 (either term, 3-0-0). Prerequisites: ECON 481/482.

ECON 553. *Economics of Taxation.* ★3 (either term, 3-0-0). Effects of taxes on allocation, distribution and stabilization objectives. Evaluation of major taxes with particular attention paid to efficiency and incidence considerations. Note: Students deficient in economics will be admitted to the course only by consent of the instructor.

ECON 559. *Health Care Economics.* ★3 (either term, 3-0-0) Problems of resource allocation in the health care sector with special reference to the Canadian economy.

ECON 561. *Transportation Economics.* ★3 (either term, 3-0-0) Economic analysis of alternative transportation systems.

ECON 563. *Regional Economics I.* ★3 (either term, 3-0-0). Methodology of regional analysis including structural studies, location theory, input-output applications, aggregative models and impact studies; regional development policy issues within the context of senior government policy objectives.

ECON 564. *Regional Economics II.* ★3 (either term, 3-0-0). The role of inter-regional mobility and substitutability of factors of production in regional growth; regional production functions and the differential impact of technical change; studies in inter-regional trade and comparative advantage in production and marketing.

ECON 565. *Resource Economics I: The Economics of Conservation and Resource Scarcity.* ★3 (either term, 3-0-0) Economic analysis of quantitative aspects of natural resource use and development; the economics of conservation; the role of resources in growth; resource scarcity; quantitative tools (benefit-cost and input-output analysis) in resource management; selected Canadian resource management; selected Canadian resource issues.

INT D 566. *Resource Economics II. Economics of the Environment.* ★3 (either term, 3-0-0) (see § 44.22/Arts and Science Calendar).

ECON 567. *Canadian Energy Resources.* ★3 (either term, 3-0-0) An economic evaluation of the role of energy resources in the Canadian economy.

ECON 570. *Industrial Economics I.* ★3 (either term, 3-0-0) Contemporary industrial structure, conduct and performance — Canadian and foreign; related public policies.

ECON 571. *Industrial Economics II.* ★3 (either term, 3-0-0). Government enterprise, public regulation of private enterprise, and specific public policies concerning particular market elements, such as advertising, delivered pricing, and patents.

ECON 581. *Macro-economic Theory I.* ★3 (either term, 3-0-0). Prerequisite or corequisite: ECON 597 or equivalent.

ECON 582. *Macro-economic Theory II.* ★3 (either term, 3-0-0). Prerequisites: ECON 581, 597 or equivalent.

ECON 586. *Mathematical Economics I.* ★3 (either term, 3-0-0). Applications and interpretations of tools used in economic analysis such as programming and game theory; inter-industry analysis, multi-sector growth models; mathematical approach to general equilibrium theory and other related areas. Emphasis on specific topics may vary from year to year. Prerequisites: ECON 486/487, or ECON 597, or equivalent.

ECON 591. *Comparative Economics.* ★3 (either term, 3-0-0). A survey of major contemporary systems of economic organization with emphasis on economic planning.

ECON 593. *The Soviet Economy.* ★3 (either term, 3-0-0). A graduate survey of the theory of the Soviet Economy; the Soviet enterprise and its behavior; Soviet planning and resource allocation; the problem of efficiency and pricing; Soviet national accounts, planning and overall economics performance; Soviet strategy of economic growth. International aspects of the Soviet economy. Soviet economic reform.

ECON 595. *Computer Applications in Economics.* ★3 (either term, 3-0-0). An introduction to the relationship between economic analysis and modern high speed computers. Topics include computer techniques useful in economics, computerized statistical techniques, and examination of selected economic models of both a mathematical and stochastic nature.

ECON 597. *Mathematical Analysis for Economists.* ★3 (either term, 3-0-0). A condensed selection of mathematical concepts used in economic analysis. Elements of logic and set theory; review of the calculus; differential and difference equations; linear algebra; inequalities; convexity. Prerequisites: MATH 202/221 or equivalent. Note: Designed for one-year M.A. candidates or provisional Ph.D. students who do not have the equivalent of ECON 486/487.

ECON 598. *Statistical Methods for Economists.* ★3 (either term, 3-0-2). Random variables and probability distributions; estimation and tests of hypotheses; single equation estimation techniques and problems; survey of simultaneous equation estimation problems. The emphasis of this course is on regression techniques as applied in economic research. Note: Designed for one-year M.A. candidates or provisional Ph.D. students who do not have the equivalent of ECON 407/408.

ECON 599. *Applied Econometrics.* ★3 (either term, 3-0-0). The role of economic theory in the process of specification and estimation of models. Interpretation and critical evaluation of applied work by means of selected topics in econometric theory. Prerequisite: ECON 408 or equivalent; corequisites: ECON 486/487.

ECON 608. *Topics in Econometrics.* ★3 (either term, 3-0-0).

ECON 612. *Topics in Economic Development.* ★3 (either term, 3-0-0).

ECON 620. *Topics in International Economics.* ★3 (either term, 3-0-0).

ECON 630. *Topics in Labor Economics.* ★3 (either term, 3-0-0).

ECON 640. *Topics in Monetary Economics.* ★3 (either term, 3-0-0).

ECON 652. *Topics in Public Economics.* ★3 (either term, 3-0-0). Topics available include: local public finance, project evaluation, theory of public choice, public enterprise pricing policies, health care economics, and fiscal systems.

ECON 664. *Topics in Regional Economics.* ★3 (either term, 3-0-0).

ECON 672. *Topics in Industrial Economics.* ★3 (either term, 3-0-0).

ECON 693. *Topics in Comparative Economics.* ★3 (either term, 3-0-0).

ECON 699. *Selected Research Topics in Economics.* ★3 (either term, 3-0-0).

ECON 900. *Non-Thesis Project.* ★3 (variable).

204.25 Educational Administration

204.25.1 THE DEGREES OF M.ED., ED.D., PH.D., AND POSTGRADUATE DIPLOMA

(1) Students who satisfy the admission requirements of Graduate Studies and Research and who have the approval of the Department of Educational Administration may pursue programs of study and research leading to the degrees of M.Ed., Ed.D., Ph.D., and Postgraduate Diploma. The M.Ed. degree may be taken by either the thesis route or the non-thesis route. Each route offers opportunities for specializing in various aspects of administration.

Taken by either route, the M.Ed. program requires two terms of residence which normally are accomplished by one winter session of study as a full-time student. The program may be completed in 14 months of continuous study, extending from the beginning of one summer session to the termination of the next. Two years of residence are required for the Ph.D. degree.

Admission to the Postgraduate Diploma requires a completion of M.Ed. degree or equivalent and experience in an administrative position. These requirements are in addition to the admission requirements of the Faculty of Graduate Studies. The program consists of eight ★3 (half-term) graduate-level courses in Educational Administration. There is no residency requirement.

(2) Each student's program consists of required courses in Educational Administration and of electives available in the Department or in other Departments in the University. Required courses provide the general theoretical framework for administration, while electives provide a degree of specialization related to research and/or future occupation. Further opportunities for specialization exist within a student's program, which may include supervised projects and such field experiences as may be arranged by staff. A student may prepare, therefore, to serve in various administrative positions in schools, school systems, colleges, universities, and government, or as a teacher in colleges and universities.

(3) A number of fellowships and assistantships in teaching and research are available for well-qualified candidates.

(4) Prospective students should consult the Chairman of the Department for further information on the program. Applicants are requested, also, to inform the Chairman of their tentative plan of attendance.

204.25.2 GRADUATE COURSES

THES 000. *Thesis.*

EDADM 501. *Evolving Concepts in Educational Administration.* ★3 (either term, 3-0-0). Note: Formerly EDADM 561.

EDADM 502. *Administrative Processes in Education.* ★3 (either term, 3-0-0).

EDADM 505. *Selected Topics in Educational Administration I.* ★3 (either term, 3-0-0).

EDADM 506. *Selected Topics in Educational Administration II.* ★3 (either term, 3-0-0).

EDADM 511. *Research Design and Data Analysis I.* ★3 (First Term, 3-0-1).

EDADM 512. *Research Design and Data Analysis II.* ★3 (Second Term, 3-0-1).

EDADM 513. *Administration of Research and Development Projects I.* ★3 (First Term, 3-0-0).

EDADM 514. *Administration of Research and Development Projects II.* ★3 (Second Term, 3-0-0).

EDADM 515. *Research Projects I.* ★3 (either term, 3-0-2). Prerequisite: Consent of the Department. Note: Formerly EDADM 506.

EDADM 516. *Research Projects II.* ★3 (either term, 3-0-2). Prerequisite: Consent of the Department. Note: Formerly EDADM 507.

EDADM 517. *Developmental Projects I.* ★3 (either term, 3-0-0).

EDADM 518. *Developmental Projects II.* ★3 (either term, 3-0-0).

EDADM 521. *Supervision of Educational Personnel.* ★3 (either term, 3-0-0).

EDADM 522. *Selected Topics in Educational Supervision.* ★3 (either term, 3-0-0).

EDADM 527. *Orientations to Administrator-Student Relationships.* ★3 (either term, 3-0-0).

EDADM 528. *Administration of Student Personnel Services.* ★3 (either term, 3-0-0).

EDADM 531. *Organization of Schools.* ★3 (either term, 3-0-0).

EDADM 532. *Organization of School Districts.* ★3 (either term, 3-0-0).

EDADM 541. *Planned Change in Educational Organizations.* ★3 (either term, 3-0-0).

EDADM 542. *Adaptive Processes in Educational Organizations.* ★3 (either term, 3-0-0). Note: Formerly EDADM 563.

EDADM 545. *Educational Planning Technologies.* ★3 (either term, 3-0-0).

EDADM 546. *Educational Planning Processes.* ★3 (either term, 3-0-0).

EDADM 547. *Models for Decision Making.* ★3 (either term, 3-0-0). Note: Formerly EDADM 569.

EDADM 548. *Management of Information Systems.* ★3 (either term, 3-0-0).

EDADM 551. *Administration of Public Education in Canada.* ★3 (either term, 3-0-0). Note: Formerly EDADM 559.

EDADM 552. *Topics in Administration of Education in Canada.* ★3 (either term, 3-0-0).

EDADM 553. *Legal Aspects of Educational Administration.* ★3 (either term, 3-0-0).

EDADM 555. *Administration of Education in Selected Countries.* ★3 (either term, 3-0-0).

EDADM 557. *Administration of Intercultural Education.* ★3 (either term, 3-0-0). Note: Formerly EDADM 535.

EDADM 565. *Educational Finance.* ★3 (either term, 3-0-0).

EDADM 566. *Operational Finance.* ★3 (either term, 3-0-0).

EDADM 571. *Organization of Post-Secondary Education.* ★3 (either term, 3-0-0).

EDADM 572. *Administration of Post-Secondary Education.* ★3 (either term, 3-0-0). Prerequisite: EDADM 571.

EDADM 591. *Supervised Individual Study I.* ★3 (either term, 3-0-0).

EDADM 592. *Supervised Individual Study II.* ★3 (either term, 3-0-0).

EDADM 593. *Seminar and Practicum in Administrative Behavior I.* ★3 (either term, 3-0-1). Prerequisite: Consent of the Department.

EDADM 594. *Seminar and Practicum in Administrative Behavior II.* ★3 (either term, 3-0-1). Prerequisite: Consent of the Department.

EDADM 605. *Problems in Educational Administration I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 663.

EDADM 606. *Problems in Educational Administration II.* ★3 (Second Term, 3-0-0). Note: Formerly EDADM 664.

EDADM 611. *Advanced Research Design and Data Analysis I.* ★3 (First Term, 3-0-0).

EDADM 612. *Advanced Research Design and Data Analysis II.* ★3 (Second Term, 3-0-0).

EDADM 625. *Administrative Behavior I.* ★3 (First Term, 3-0-0).

EDADM 626. *Administrative Behavior II.* ★3 (Second Term, 3-0-0).

EDADM 635. *Organization Theory I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 661.

EDADM 636. *Organization Theory II.* ★3 (Second Term, 3-0-0). Note: Formerly EDADM 662.

EDADM 645. *Policy Development in Education I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 667.

EDADM 646. *Policy Development in Education II.* ★3 (Second Term, 3-0-0). Note: Formerly EDADM 668.

EDADM 655. *Politics of Education I.* ★3 (First Term, 3-0-0). Note: Formerly EDADM 659.

EDADM 656. *Politics of Education II.* ★3 (Second Term, 3-0-0). Note: Formerly EDADM 660.

EDADM 665. *Economic Environment of Education I.* ★3 (First Term, 3-0-0).

EDADM 666. *Economic Environment of Education II.* ★3 (Second Term, 3-0-0).

EDADM 671. *Problems in Administration of Post-Secondary Education I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

EDADM 672. *Problems in Administration of Post-Secondary Education II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department.

EDADM 691. *Supervised Individual Study I.* ★3 (either term, 3-0-0).

EDADM 692. *Supervised Individual Study II.* ★3 (either term, 3-0-0).

EDADM 900. *Non-Thesis Project.* ★3 (variable). Comprehensive problems in Educational Administration activities. Includes preparation of a final report.

EDADM 901. *Non-Thesis Project.* ★6 (variable). Comprenhensive problems in Educational Administration activities. Includes preparation of a final report.

EDADU 523. *Administration of Further Education.* ★3 (either term, 3-0-0).

204.26 Educational Foundations

204.26.1 THE DEGREES OF M.ED. AND PH.D.

(1) At the master's degree level the Department offers programs in the following fields: history of education, philosophy of education, sociology of education, comparative and international education, community education, anthropology and education, and intercultural education. At the doctoral degree level the Department offers programs in history of education, philosophy of education, sociology of education, and comparative and international education.

(2) Graduate programs normally include related courses offered by departments of the Faculty of Arts and other departments of the Faculty of Education.

(3) A number of Graduate Assistantships are available to well-qualified candidates.

(4) Inquiries concerning admission, programs, and assistantships should be directed to the chairman of the Department.

204.26.2 GRADUATE COURSES

THES 000. *Thesis.*

EDFDN 500. *Education Seminar.* ★0. Non-credit. (Hours to be arranged). Prerequisite: Consent of the Department.

EDFDN 501. *Conference Course on Selected Topics.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 502. *Conference Course on Selected Topics.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDFDN 510. *Education from an Anthropological Perspective.* ★3 (either term, 3-0-0). Formerly EDFDN 509. Prerequisite Consent of the Department.

EDFDN 512. *Anthropological Theory and Education.* ★6 (3-0-0). Formerly EDFDN 526.

EDFDN 521. *Studies of Educational Change in Western Nations* ★3 (either term, 3-0-0). Formerly EDFDN 571. Prerequisite Consent of the Department.

EDFDN 522. *Functions of Education in the Development of Emerging Nations.* ★3 (either term, 3-0-0). Formerly EDFDN 573. Prerequisite: Consent of the Department.

EDFDN 523. *Development Theory and Education.* ★3 (either term, 3-0-0). An examination of the meaning of the concept "Societal Development". A review of theories of development put forward by selected writers, and an analysis of the role of

education in the development process, with particular attention to the Third World. Prerequisite: Consent of the Department. Formerly EDFDN 575.

EDFDN 530. *History of Education in Canada.* ★3 (either term, 3-0-0). A survey of studies in the history of formal and informal educational institutions in Canada, and their interrelationship with Canadian Society. Formerly EDFDN 504. Prerequisite: Consent of the Department.

EDFDN 532. *Topics in the History of Education in Western Canada.* ★3 (either term, 3-0-0). Formerly EDFDN 587. Prerequisite: Consent of the Department.

EDFDN 534. *Topics in the History of Education in Eastern Canada.* ★3 (either term, 3-0-0). Formerly EDFDN 585. Prerequisite: Consent of the Department.

EDFDN 540. *History of Modern Education.* ★3 (either term, 3-0-0). Formerly EDFDN 503. Prerequisite: Consent of the Department.

EDFDN 541. *History of Higher Education.* ★3 (either term, 3-0-0). Formerly EDFDN 579. Prerequisite: Consent of the Department.

EDFDN 542. *History of Education in the United States Before 1900.* ★3 (either term, 3-0-0). Formerly EDFDN 583. Prerequisite: Consent of the Department.

EDFDN 543. *History of Education: Method and Structure.* ★3 (either term, 3-0-0). Formerly EDFDN 589. Prerequisite: Consent of the Department.

EDFDN 544. *History of Education as a Field of Study: Its Emergence and Development.* ★3 (either term, 3-0-0).

EDFDN 545. *Studies in the History of Schooling and Curriculum.* ★3 (either term, 3-0-0).

EDFDN 546. *Childhood and Childrearing in Western Culture: An Historical Perspective.* ★3 (either term, 3-0-0).

INT D 546. *Soviet and East European Studies: An Interdisciplinary Seminar.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDFDN 547. *History of English Education since the Industrial Revolution.* ★3 (either term, 3-0-0).

EDFDN 550. *Philosophical Analysis and Education.* ★3 (either term, 3-0-0). Formerly EDFDN 505. Prerequisite: Consent of the Department.

EDFDN 551. *Philosophy of Education I.* ★3 (either term, 3-0-0). Formerly EDFDN 591. Prerequisite: Consent of the Department.

EDFDN 552. *Philosophy of Education II.* ★3 (either term, 3-0-0). Formerly EDFDN 593. Prerequisite: Consent of the Department.

EDFDN 553. *Philosophical Analysis of Teaching.* ★3 (either term, 3-0-0). Formerly EDFDN 531. Prerequisite: Consent of the Department.

EDFDN 554. *Philosophical Foundations of Educational Research.* ★3 (either term, 3-0-0). Formerly EDFDN 533. Prerequisite: Consent of the Department.

EDFDN 555. *Moral Concepts in Education.* ★3 (either term, 3-0-0). Formerly EDFDN 537. Prerequisite: Consent of the Department.

EDFDN 556. *The Educational Theory of a Selected Philosopher.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 557. *Learning and the Philosophy of Knowledge.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 560. *Education from a Sociological Perspective.* ★3 (either term, 3-0-0). Formerly EDFDN 507. Prerequisite: Consent of the Department.

EDFDN 561. *Community Education: A Sociological Perspective.* ★3 (either term, 3-0-0). The organization and processes of community education at the local, provincial and national levels of social interaction as seen from the theory and research of contemporary sociology. Formerly EDFDN 511. Prerequisite: Consent of the Department.

EDFDN 562. *Development and Theory of Sociology of Education.* ★3 (either term, 3-0-0). Formerly EDFDN 513. Prerequisite: Consent of the Department.

EDFDN 563. *Research Methods in Sociology of Education.* ★3 (either term, 3-0-0). Formerly EDFDN 515. Prerequisite: Consent of the Department.

EDFDN 564. *Education and Social Change.* ★3 (either term, 3-0-0). Formerly EDFDN 517. Prerequisite: Consent of the Department.

EDFDN 565. *Sociology of Higher Education.* ★3 (either term, 3-0-0). Formerly EDFDN 519. Prerequisite: Consent of the Department.

EDFDN 601. *Conference Course on Selected Topics.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDFDN 602. *Conference Course on Selected Topics.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDFDN 620. *Comparative and International Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 640. *History of Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 641. *History of Education: Historiography.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 642. *History of Education: Selected Areas.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 650. *The Nature of Philosophy in Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 651. *Traditional Philosophies of Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 652. *Analytic Philosophy of Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 660. *Sociology of Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 661. *Sociological Theory in Education.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 662. *Sociology of Education: Research Methodology.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDFDN 900. *Non-Thesis Project.* ★6 (variable).

204.27 Educational Psychology

204.27.1 THE DEGREES OF M.ED.. ED.D.. AND PH.D.

(1) The Department offers programs leading to the M.Ed., Ed.D., and Ph.D., in the following specializations: educational psychology; counselling psychology; school psychology; and special education. In special Education there is a special program in Deaf Education which meets the requirements for ACEHI certification. It is designed to provide specialist training for teachers and advanced training for administrators, consulting research personnel, and other requiring specialist skills in this area. It can be combined with other areas of activity of the Department or with those of other Departments.

It also offers a program at the M.Ed. level in cooperation with the Division of East European Studies which leads to a notation of specialization in East European and Soviet Studies.

(2) In addition to completing a thesis, all candidates for the master's degree are required to demonstrate competence in research methods, personality theory, developmental psychology, learning theory and social psychology. The required level of competence may be demonstrated by (a) successful completion of Educational Psychology 502 and effectively participating in Educational Psychology 594, *Core Seminar,* which is directed by a number of members of staff and involves six hours per week of scheduled classes over a full academic year; or (b) successful completion of the following courses: Educational Psychology 502, 515, 569, 571, 591; or (c) by offering credit in approved equivalents; or (d) by special examination or (e) for students in the deaf education program by taking Educational Psychology 502, 569 and 571 or their equivalents.

(3) Normally the completion of the master's requires two years, at least one of which must be in residence. The doctoral degree normally requires two years beyond the master's.

(4) The Department offers financial support in the form of Graduate Assistantships through the Faculty of Graduate Studies and Research.

(5) Initial inquiries about the Department's programs and about assistantships should be addressed to the Chairman, Department of Educational Psychology.

204.27.2 GRADUATE COURSES

THES 000. *Thesis.*

EDPSY 501. *Nonparametric Statistical Inference in Educational Research.* ★3 (either term, 3-0-0).

EDPSY 502. *Introduction to Educational Research.* ★6 (3-0-3).

EDPSY 504. *Statistics and Research Design in Education.* ★6 (3-0-3). Prerequisite: EDPSY 502 or equivalent.

EDPSY 510. *Counselling Theory I.* ★6 (2-0-4). Prerequisite or corequisite: EDPSY 515 or consent of the Department.

EDPSY 511. *Vocational Development and Choice.* ★3 (either term, 3-0-0).

EDPSY 512. *Seminar and Practicum in Counselling I.* ★6 (2-1.5s-4). Prerequisite or corequisite: EDPSY 515 and 510 or equivalent and consent of the Department.

EDPSY 513. *Group Assessment in Guidance and Counselling.* ★3 (either term, 3-0-1). Prerequisite: EDPSY 487 or equivalent or consent of the Department.

EDPSY 515. *Theories of Personality.* ★3 (either term, 3-0-0).

EDPSY 517. *Religious and Moral Development and Education.* ★3 (either term, 3-0-0).

EDPSY 518. *Seminar and Practicum in Group Counselling.* ★6 (0-3s-4). Prerequisites: EDPSY 512 or equivalent and consent of the Department.

EDPSY 519. *Seminar in Elementary School Counselling.* ★3 (Second Term, 0-3s-0). Prerequisite: Consent of the Department.

EDPSY 521. *Interpersonal Relations in Education.* ★3 (either term, 0-0-3). Prerequisite: Consent of the Department.

EDPSY 524. *Seminar and Practicum in School Psychology I.* ★6 (3-0-3). Prerequisite: Consent of the Department.

EDPSY 531. *Psychology of Exceptional Children.* ★3 (either term, 3-0-0). An overview of the psychology of exceptional children with emphasis on intellectual and emotional deviance, learning disability, mental retardation, sensory deficits and the problems of deprivation.

EDPSY 533. *Advanced Course in Psychoeducational Diagnosis.* ★3 (First Term, 3-0-1). To provide skill in administration and interpretation of a variety of psycoeducational measures which show potential in advancing our understanding of exceptional children.

EDPSY 535. *Educational Programming from Psychoeducational Data.* ★3 (Second Term, 3-0-1). Prerequisite: EDPSY 533 or consent of the Department.

EDPSY 537. *Task Analysis and Instructional Design in Special Education.* ★3 (First Term, 0-4L-0). To provide skill in developing curriculum materials and instructional sequencing and criterion referenced tests through task analysis.

EDPSY 538. *Practicum in Special Education.* ★6 (0-4L-0). Supervised practicum in a variety of special education settings. Prerequisite: EDPSY 531.

EDPSY 539. *Behavior Management in Schools.* ★3 (Second Term, 0-4L-0). To provide skill in implementing behavior management practices in classroom settings as well as skills for assisting teachers to implement behavior management techniques.

EDPSY 541. *Development and Learning of Exceptional Children.* ★3 (either term, 3-0-0). A consideration of the value of current theories in learning and development for understanding exceptional children. Prerequisite or corequisite: EDPSY 531, 569 and 571 or consent of the Department.

EDPSY 542. *Theory and Research in Mental Retardation.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 544. *Seminar on Research in Special Education.* ★6 (0-3s-0). Prerequisite or corequisite: EDPSY 502 or equivalent.

EDPSY 546. *Seminar in Psychopathology of the Child.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDPSY 555. *Cross-Cultural Psychology: Cognitive Development.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDPSY 560. *Seminar and Research in Developmental Psychology.* ★6 (0-3s-1). Prerequisite: Consent of the Department. Note: All students registered in the Basic Area must take EDPSY 560 instead of EDPSY 569.

EDPSY 562. *Comparative Educational Psychology: Soviet and Western.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 568. *Seminar and Research in Learning.* ★6 (0-3s-1). Prerequisite: Consent of the Department. Note: All students registered in the Basic Area must take EDPSY 568 instead of EDPSY 571.

EDPSY 569. *Advanced Educational Psychology: Development.* ★3 (either term, 3-0-0). Note: All students registered in the Basic Area must take EDPSY 568 instead of EDPSY 571.

EDPSY 571. *Advanced Educational Psychology: Learning.* ★3 (either term, 3-0-0).

EDPSY 578. *Psychology of Language, Cognition and Bilingualism.* ★6 (3-0-0). Prerequisite: Consent of the Department.

EDPSY 580. *Seminar and Research in Educational Measurement.* ★6 (3-2s-0). Prerequisite: EDPSY 502, its equivalent or consent of the Department.

EDPSY 591. *Social Psychology and Education.* ★3 (either term, 3-0-0).

EDPSY 592. *Seminar and Research in the Social Psychology of School and Classroom.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

EDPSY 594. *Core Seminar.* ★12 (0-6s-0). An integrated course limited to graduate students requiring the foundation normally provided through EDPSY 515, 569, 571, and 591. Subsequent registration in these courses will not be approved.

EDPSY 597. *Special Seminars.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

EDPSY 598. *Special Seminars.* ★6 (0-3s-0). Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

EDPSY 599. *Individual Directed Reading and Research.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department. May be repeated.

EDPSY 610. *Advanced Counselling Theory II.* ★6 (3-0-0).

EDPSY 612. *Seminar and Practicum in Counselling II.* ★6 (3-3s-3). Incorporates internship.

EDPSY 616. *Research in Counselling.* ★6 (3-0-0).

EDPSY 620. *Personality, Affect, and Cognition.* ★6 (3-0-0).

EDPSY 624. *Seminar and Practicum in School Psychology II.* ★6 (3-0-3).

EDPSY 640. *Special Education.* ★6 (3-0-0).

EDPSY 660. *Developmental Psychology.* ★6 (3-0-0).

EDPSY 676. *Psychology of Learning.* ★6 (3-0-0).

EDPSY 680. *Educational Measurement.* ★6 (3-0-3).

EDPSY 521. *Psychology of Learning and Teaching at the Adult Level.* ★3 (either term, 3-0-0). A study of learning and teaching from the background of educational and developmental psychology. Coordinated by the Department of Educational Psychology.

204.28 Electrical Engineering

204.28.1 THE DEGREES OF M.ENG., M.SC. AND PH.D.

(1) The Department of Electrical Engineering offers postgraduate courses, leading to the M.Eng., M.Sc. and Ph.D. degrees, to qualified graduates of recognized universities.

(2) Considerable research facilities are available in a number of areas, notably biomedical engineering, nonlinear, sample data, and optimal control systems, lasers, microprocessor applications, microwave semiconductor devices, microwave communications, microwave power, particle accelerators, plasmas, space research, power systems and ultra-high vacuum and surface phenomena.

(3) A normal requirement for the M.Sc. degree is nine graduate single-term courses (or equivalent) and a Thesis (A reduction in the number of courses is under review). These courses must include three of the core courses listed in (7) below as well as Electrical Engineering 600. Of the remaining courses two should normally be taken outside the Department. M.Sc. candidates take Electrical Engineering 600 in the Second Term of their program and are required to submit a research report to a supervisory committee which consists of their thesis supervisor and one other faculty member. The topic of the report is to be chosen in consultation with the thesis supervisor. This report must be submitted before March 31 of the year in which Electrical Engineering 600 is taken.

(4) Master of Engineering programs consist of ten single-term courses (under review), three of which must be core courses as listed in (7) below, plus a project which is approximately equivalent to a single-term course. A candidate may complete a Master of Engineering program in a minimum of nine months. The minimum residence required is one term for a B.Sc. graduate with at least one year of post-B.Sc. experience, and one session for a B.Sc. graduate with less than one year of post-B.Sc. experience. The maximum time permitted for completion of a Master of Engineering program is five years from the date of first registration.

(5) For the Ph.D. program, course requirements depend upon individual circumstances and must be approved by the Department of Electrical Engineering. The emphasis is on research leading to a thesis of high calibre. The departmental course program steering committee will assess the student's background and recommend courses to make up for course deficiencies (if any), and each student's supervisory committee will assess his/her research ability. A Ph.D. candidate must take E E 609 and submit a research proposal.

(6) Financial assistance can be arranged in the form of Graduate Assistantships, scholarships and Research Grant Assistantships listed in the Awards section of the Calendar.

(7) The core courses are E E 622, E E 631, E E 655, E E 670, and E E 656.

204.28.2 GRADUATE COURSES

THES 000. *Thesis.*

NOT ALL THESE COURSES WILL BE OFFERED EACH YEAR.

E E 600. *Research Project.* ☐0.5 (Second Term, 0-2s-0).

E E 601. *Special Topics in Electrical Engineering I.* ☐3.0 (First Term, 3-0-0). Intended to enable individual students to study special topics under the supervision of a member of the faculty. (★3.)

E E 602. *Special Topics in Electrical Engineering II.* ☐3.0 (Second Term, 3-0-0). Same as E E 601 except this course number is to be used during the Second Term. (★3.)

E E 603. *Departmental Research Seminar I.* ☐0.5 (First Term, 0-2s-0). (★0.)

E E 609. *Departmental Research Seminar II.* ☐0.5 (Second Term, 0-2s-0). For graduate students in the Department of Electrical Engineering to report on topics related to their field of specialization. (★0.)

E E 622. *Power System Problems I.* ☐3.0 (First Term, 3-0-0). Selected power system topics such as stability, circuitbreaking, economic scheduling of generation, overvoltages, digital and analog approaches to analysis. (★3.)

E E 623. *Power System Problems II.* ☐3.0 (Second Term, 3-0-0). A continuation of E E 622 considering topics such as tie line control, excitation and its effect on the system. The application of control systems is emphasized. (★3.)

E E 628. *Radio Astronomy Techniques.* ☐3.0 (Second Term, 3-0-0). Radiometry, galactic background and sources. Antennas and arrays as spatial frequency filters. Aperture synthesis, earth-rotation synthesis, interferometry. Correlation receivers. (★3.)

E E 631. *Active Networks.* ☐3.0 (First Term, 3-0-0). The synthesis of major electron systems. Course material will be presented by means of actual design of some major systems. Building block theory will be treated as required as design proceeds. D.C. to R.F. systems will be covered with emphasis on the latter. Background material to be obtained from reference texts and selected papers. (★3.)

E E 632. *Solid State Circuit Design.* ☐3.0 (Second Term, 3-0-0). Operational amplifier design; regulated power supplies; class D amplifiers; active filters; power amplifiers; distortion analysis; frequency response of operational amplifiers. (★3.)

E E 635. *Logical Design of Digital Computers.* ☐3.0 (First Term, 3-0-0). A continuation of E E 479. Introduction to microprocessors including architecture, programming, and input/output problems. The course includes some "hands on" work with microprocessors. (★3.)

E E 641. *High Vacuum Technology.* ☐3.8 (either term, 3-0-3/2). Gas kinetics; gas flow; pumping speed theory; pumping methods; pressure, measurement; vacuum system design; leak detection techniques; residual gas analysis; sorption processes. (★3.)

E E 642. *Special Topics Using High Vacuum Technology.* ☐3.0 (Second Term, 3-0-0). Ion bombardment of solid and thin film surfaces; sputtering of thin films; growth; structure and properties of thin films; field ion microscopy. (★3.)

E E 645. *Selected Laser Topics.* ☐3.0 (either term, 3-0-0). Design, construction and operational aspects of various types of lasers; principles of modulation and detection; transmission medium effects; optical components and concepts; information systems; noise and quantum considerations; special applications. (★3.)

E E 651. *Network Synthesis I.* ☐3.0 (First Term, 3-0-0). Energy functions: positive real functions; driving point function synthesis of two element and three element one port passive networks; introduction to transfer function synthesis of passive two port networks; determination of network functions; introduction to approximation. (★3.)

E E 652. *Network Synthesis II.* ☐3.0 (Second Term, 3-0-0). Transfer function synthesis of passive lossless and lossy two port networks; use of Matrix Factorization techniques in network synthesis; approximation; time domain synthesis of passive and active networks; concepts of equivalence in network theory. Prerequisite: E E 651 or equivalent. (★3.)

E E 655. *Introduction to Modern Control Theory.* ☐3.0 (First Term, 3-0-0). System concepts, finite dimensional vector spaces, matrices and linear operators, state space and state equations, formulation and solution, equilibrium and stability, Lyapunov, Popov, etc., controllability and observability, optimal control, concepts, principle of optimality, least square theory. (★3.)

E E 656. *Statistical Communications.* ☐3.0 (Second Term, 3-0-0). Principles of statistics; correlation function and power spectrum of stationary processes; Wienir and Kalman filtering. (★3.)

E E 657. *Advanced Communication Theory.* ☐3.0 (Second Term, 3-0-0). Principles of optimum receiver design, signal coding for noisy channels, channel reliability, selected topics in communication system design. (★3.)

E E 660. *Optimal Control Systems.* ☐3.0 (Second Term, 3-0-0). The optimal control problem. Cost functionals. Use of Calculus of Variations in Optimal Control. Optimization by Pontrygin's Maximum Principle and Dynamic Programming Applications. Linear Regulator Problem. Computational methods of solving two-point boundary value problems. Prerequisite: E E 655 or equivalent. (★3.)

E E 662. *Discrete Data Control Systems I.* ☐3.0 (First Term, 3-0-0). Sampling and Data Reconstruction processes. Z-transform Theory, state equations of discrete-data systems, stability, introduction to optimal design of discrete-data systems using minimum quadratic performance index. (★3.)

E E 663. *Discrete Data Control Systems II.* ☐3.0 (Second Term, 3-0-0). Optimal control of discrete-data systems, statistical design, digital simulation. (★3.)

E E 665. *Biosystems Modeling and Analysis.* ☐3.0 (either term, 3-0-0). Principles of modeling, control theory, system identification, related to biological systems. Applications to modeling and analysis of selected biological systems. (★3.)

E E 666. *Nonlinear Systems Theory.* ☐3.0 (either term, 3-0-0). Analysis of nonlinear systems with deterministic and random inputs using state space methods, perturbation methods, averaging methods, describing function methods, functional analysis. Topics in stability theory. (★3.)

E E 668. *Sensory Communication.* ☐3.0 (either term, 3-0-0). Topics from the theories of information, communications. Mechanisms of sensory data processing, neural signals and noise, sensory channels capacities. Applications to display engineering and man-machine communications. (★3.)

E E 670. *Electromagnetic Theory.* ☐3.0 (First Term, 3-0-0). Review of electrostatics, magnetostatics, Maxwell's equation, wave equation. Relation of microscopic to macroscopic fields. Maxwell stress tensor, particle dynamics, ponderomotive forces on material bodies, field momentum, energy densities. Properties of electric and magnetic materials. Antennas and radiation. Propagation in anisotropic media. (★3.)

E E 680. *Microwave Measurements and Techniques.* ☐2.8 (either term, 2-0-3/2). Measurement of power; impedance and frequency; representation and measurement of microwave circuits; resonant cavity characteristics; microwave properties of dielectrics; noise in microwave communications systems. (★3.)

E E 681. *Semiconductor Microwave Electronics.* ☐3.0 (either term, 3-0-0). Review of semiconductor physics, high field conduction in semiconductors. IMPATT and TRAPATT diodes, Barrier (or Punch through) Injection and Transit Time diodes, Transferred Electron (Gunn) diodes, p-i-n diodes, varactors, Schottky-barrier diodes, Transistors and circuits. Detectors and Mixers — theory and design considerations. Two port oscillators — theory, design and injection locking. Theory of parametric systems. (★3.)

E E 682. *Microwave Circuit Theory.* ☐3.0 (either term, 3-0-0). Scattering and impedance matrices of microwave junctions; microwave filter design, discontinuities in transmission lines; non-uniform transmission lines; non-reciprocal microwave elements. (★3.)

E E 693. *Elements of Plasma Theory.* ☐3.0 (either term, 3-0-0). The theoretical background for investigating plasmas developed from Kinetic theory; topics include Saha's equation; Debye potential; Liouville's equation; the BBGKY kinetic theory; the moment equations including magnetohydrodynamic problems, the Vlassov theory with examination of plasma oscillations and Landau damping. (★3.)

E E 694. *Advanced Topics in Plasma Theory.* ☐3.0 (either term, 3-0-0). (★3.)

E E 695. *Plasma Devices and Diagnostics.* ☐3.0 (either term, 3-0-0). Methods of obtaining plasmas; shock tubes; discharges etc.; plasma diagnostics including electric, magnetic, and optical probing of plasmas. (★3.)

E E 900. *Non-Thesis Project.* ☐0.5 (variable). (★variable.)

204.28.3 READING PROJECTS

E E 629. *Advanced Topics in Power Systems.* ☐3.0 (either term, 3-0-0). (★3.)

E E 639. *Advanced Topics in Electronics.* ☐3.0 (either term, 3-0-0). (★3.)

E E 649. *Advanced Topics in Lasers.* ☐3.0 (either term, 3-0-0). (★3.)

E E 659. *Advanced Topics in Controls.* ☐3.0 (either term, 3-0-0). (★3.)

E E 669. *Advanced Topics in Biomedical Engineering.* ☐3.0 (either term, 3-0-0). (★3.)

E E 671. *Advanced Topics in Electromagnetics.* ☐3.0 (either term, 3-0-0). (★3.)

E E 689. *Advanced Topics in Microwaves.* ☐3.0 (either term, 3-0-0). (★3.)

E E 699. *Advanced Topics in Plasma.* ☐3.0 (either term, 3-0-0). (★3.)

204.29 Elementary Education

204.29.1 THE DEGREES OF M.ED., ED.D., AND PH.D.

(1) The Department of Elementary Education offers graduate programs leading to the degrees of M.Ed., Ed.D., and Ph.D.

(2) Graduate instruction is offered in the above degree programs related to elementary education. These programs are designed to help prepare consultants and supervisors, master teachers and personnel for teacher education institutions.

(3) Before a student can be admitted as a candidate for the M.Ed. or higher degree, his/her record must be acceptable to the Faculty of Graduate Studies and Research and to the Department. Admission requirements include the holding of a valid teaching certificate and an undergraduate degree, equivalent to The University of Alberta B.Ed. degree, with good standing, as well as successful teaching experience in schools.

(4) Admission to the Ed.D. or Ph.D. program normally requires the equivalent of a University of Alberta M.Ed. degree. Under certain circumstances, it is possible to enter with the equivalent of the B.Ed. degree, but in such instances, potential candidates must plan at least three years of continuous attendance.

(5) Two routes to the M.Ed. degree are available. Requirements for the M.Ed. degree with thesis normally include five full graduate courses. Requirements for the M.Ed. degree non-thesis route normally include seven full courses and an independent project equivalent to one full course. The Ed.D and Ph.D. programs have the same requirement for successful teaching and include a course program arranged with the staff of the Department.

(6) The M.Ed. is normally completed in fourteen consecutive months, beginning with a summer session. The Ed.D. and Ph.D. programs normally require two full years of residence.

(7) A number of Graduate Assistantships are available.

(8) Application forms for admission from the Faculty of Graduate Studies and Research and further information regarding the programs may be secured by writing to the Chairman of the Department.

204.29.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

ED CI 443. *School Library Services.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346 or consent of the Department.

ED CI 446. *Selection of School Library Materials.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346.

ED CI 447. *Organization of School Library Materials.* ★3 (either term, 3-0-2). Prerequisite: ED CI 346.

204.29.3 GRADUATE COURSES

THES 000. *Thesis.*

ED CI 500. *Research Seminar.* ★0. Reports and discussions by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures. The seminar will be offered as arranged. No course credit will be given.

ED CI 501. *Seminar in Elementary Education.* ★3 (either term, 0-3s-0). Prerequisite: Consent of the Department.

ED CI 502. *Research Seminar.* ★6 (0-3s-0). Prerequisite: Consent of the Department.

ED CI 503. *Early Childhood Education: Home/School/Community Relations.* ★3 (either term, 3-0-0). This course is designed to investigate the teacher's role in improving communication among the school, home, and community. Prerequisite: Consent of the Department.

ED CI 504. *Program Development in Early Childhood.* ★3 (either term, 3-0-0). Prerequisite: ED CI 404 or consent of the Department.

ED CI 505. *Research in Program Development in Early Childhood Education.* ★3 (either term, 3-0-0). Prerequisite: ED CI 504 or consent of the Department.

ED CI 506. *Program Development in Elementary School Physical Education.* ★6 (0-3L-0). Prerequisites: Graduate students only. Formerly MOV 530.

ED CI 508. *Program Development in Second Languages at the Elementary Level.* ★6 (3-0-0). Prerequisites: CU ME 310, ED CI 408, or 409 or consent of the Department.

ED CI 509. *Problems in the Teaching of English as a Second or Other Language* [TESOL]. ★3 (either term, 3-0-0). Prerequisites: ED CI 309 and 409 or equivalent.

ED CI 510. *Program Development in the Teaching of English as a Second or Other Language* [TESOL]. ★3 (either term, 3-0-0). Prerequisite: ED CI 309 and ED CI 409, or equivalent.

ED CI 512. *Program Development in Elementary Social Studies I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 412 and 413 or consent of the Department.

ED CI 513. *Program Development in Elementary Social Studies II.* ★3 (either term, 3-0-0). Prerequisite: ED CI 512 or consent of the Department.

ED CI 516. *Program Development in Elementary School Mathematics I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 417 or consent of the Department.

ED CI 517. *Research in Mathematics Education I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 417 or consent of the Department.

ED CI 520. *Research in Elementary School Science.* ★3 (either term, 3-0-0). Prerequisite: ED CI 420 or consent of the Department.

ED CI 521. *Program Development in Elementary School Science.* ★3 (either term, 3-0-0). Prerequisite: ED CI 420 or consent of the Department.

ED CI 522. *Theory of Reading Processes.* ★3 (either term, 3-0-0). Prerequisite: One half-course equivalent in Reading education and one half-course equivalent in Language education.

ED CI 523. *Research in Reading Processes.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 522 or consent of the Department.

ED CI 524. *Diagnostic Instruments in Reading.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 525. *Diagnosis of Reading Disability.* ★3 (either term, 3-0-3). Prerequisite: Consent of the Department.

ED CI 526. *Remedial Procedures for Reading Problems.* ★3 (either term, 3-0-3). Prerequisite: Consent of the Department.

ED CI 527. *The Reading Curriculum.* ★3 (either term, 3-0-0). Prerequisite: ED CI 522 or consent of the Department.

ED CI 528. *Organization of the Reading Program.* ★3 (Second Term, 3-0-0). Problems of organization, development, evaluation and supervision of the reading program. Prerequisite: Consent of the Department.

ED CI 529. *Language Acquisition and Growth in Young School Children.* ★3 (either term, 3-0-0). Prerequisite: ED CI 429 or 430 or equivalent.

ED CI 530. *Program Development for the Expansion of Elementary Children's Language.* ★3 (either term, 3-0-0). Prerequisite: ED CI 529.

ED CI 533. *Seminar in Group Projects in Elementary Education 3.* ★variable (either term, variable). Prerequisite: Consent of the Department.

ED CI 537. *Program Development and Research in Elementary School Art: Performance.* ★3 (either term, 3-0-0). Prerequisites: ED CI 437 and ED CI 438 or consent of the Department.

ED CI 538. *Program Development and Research in Elementary School Art: History and Criticism.* ★3 (either term, 3-0-0). Prerequisites: ED CI 437 and ED CI 438 or consent of the Department.

ED CI 539. *Program Development in Elementary School Music.* ★3 (First Term, 3-0-0). Prerequisite: ED CI 439 or consent of the Department.

ED CI 540. *Research in Elementary School Music.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 539 or consent of the Department.

ED CI 544. *Directed Individual Study in Elementary Education.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 545. *Directed Individual Study in Elementary Education.* ★6 (variable). Prerequisite: Consent of the Department.

ED CI 547. *Directed Study in School Library Programs.* ★3 (either term, 3-0-0). Prerequisite: ED CI 446 and 447 or consent of the instructor.

ED CI 549. *Curriculum Development.* ★3 (either term, 3-0-0). Curriculum theory and research with particular reference to determinants of curriculum, curriculum development, implementation and evaluation.

ED CI 550. *Current Curriculum Developments.* ★3 (Second Term, 3-0-0). Problems and practices in innovations and evaluation of current curriculum developments.

ED CI 551. *Curriculum Design.* ★3 (either term, 3-0-0). The application of curriculum theory to a specific task; the planning of a curriculum which can be used by teachers as a point of departure for their teaching.

ED CI 600. *Curriculum and Instruction Laboratory.* ★0. Discussion and supervision of experiences designed to prepare doctoral students for pre-service and in-service education of Elementary School teachers. Prerequisite: Consent of the Department.

ED CI 601. *Seminar in Elementary Education.* ★3 (both terms, 0-1.5s-0) or (either term, 0-3s-0). Discussion of perennial issues and current solutions to problems in elementary education. Prerequisite: Consent of the Department.

ED CI 602. *Conference Course in Elementary Education.* ★6 (variable).

ED CI 603. *Symposium in Elementary Education.* ★3 (both terms, 1.5-0-0) or (either term, 3-0-0). Research reports by staff and students. Prerequisite: Consent of the Department.

ED CI 612. *Research in Elementary School Social Studies.* ★3 (First Term, 3-0-0).

ED CI 613. *Planning Research in Elementary School Social Studies.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 612.

ED CI 616. *Program Development in Elementary School Mathematics II.* ★3 (either term, 3-0-0).

ED CI 617. *Research in Mathematics Education II.* ★3 (either term, 3-0-0).

ED CI 623. *Theories and Models of Reading Process.* ★3 (either term, 3-0-0).

ED CI 624. *Research I. Bases of Knowledge for Reading Research.* ★3 (either term, 3-0-0).

ED CI 625. *Research II. Recent Research in Reading.* ★3 (either term, 3-0-0).

ED CI 626. *Theory and Analysis of Reading Assessment.* ★3 (either term, 3-0-3). Prerequisite: ED CI 525.

ED CI 627. *Evaluation and Administration of Remedial Procedures.* ★3 (either term, 3-0-3).

ED CI 629. *Research in Language.* ★6 (3-0-0).

ED CI 637. *Research in Art Education.* ★6 (3-0-0).

ED CI 644. *Individual Project.* ★3 (either term, variable). Comprehensive problems in Curriculum and Instruction — Elementary. Includes preparation of final report.

ED CI 645. *Individual Project.* ★6 (variable). Comprehensive problems in Curriculum and Instruction — Elementary. Includes preparation of final report.

ED CI 649. *Curriculum Evaluation.* ★3 (First Term, 3-0-0). An interdepartmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3 (either term, 3-0-0). Prerequisite or corequisite: ED CI 649. The preparation and implementation of an evaluation study in the field.

ED CI 900. *Non-Thesis Project.* ★6 (variable). Non-thesis route research project. Includes preparation of final report.

ED CI 901. *Non-Thesis Project.* ★3 (variable). Non-thesis route research project. Includes preparation of final report.

204.30 English

204.30.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of English offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees in English Language and Literature.

(2) The M.A. program of a student with an honors B.A. in English (or its equivalent) will normally consist of three full-term graduate courses (or their equivalent) in the Department, some practical training in bibliography, a thesis, and an oral defence of the thesis. The student will spend a minimum of one year in residence. The M.A. program of a student without an honors B.A. in English may take longer and will be based upon the number of English courses that have been taken as an undergraduate, and will also include some practical training in bibliography, a thesis, and an oral defence of the thesis. A reading knowledge of one language other than English will be required of all students (normally French or German, though other languages may be approved).

(3) A student with an M.A. in English (or its equivalent) may be admitted as a provisional candidate for the Ph.D. degree. The program of a provisional candidate will normally include four full-term graduate courses (or their equivalent), one of which will be taken outside the Department of English, departmental examinations, and an oral candidacy examination. The student must demonstrate a reading knowledge of two languages other than English (usually French and German). After a student has passed all examinations, he/she will become a candidate for the Ph.D., and will then submit a thesis and make an oral defence of the thesis.

(4) The Department has regular provision for Graduate Assistantships. Application should be made, if possible, by February 1.

204.30.2 GRADUATE COURSES

THES 000. *Thesis.*

Selected courses from the following list will be offered each year. Details of each year's program may be obtained early the preceding Spring from the Chairman of the Graduate Committee.

ENGL 553. *Directed Reading.* ★6 (3-0-0).
ENGL 554. *Directed Reading.* ★3 (First Term, 3-0-0).
ENGL 555. *Directed Reading.* ★3 (Second Term, 3-0-0).
ENGL 560. *Bibliography and Methods of Research.* ★0 (1-0-0).
ENGL 567. *Studies in Literary History.* ★3 (either term, 3-0-0).
ENGL 568. *Literary Criticism.* ★6 (3-0-0).
ENGL 569. *Studies in Literary Criticism.* ★3 (either term, 3-0-0).
ENGL 576. *Studies in the English Language.* ★6 (3-0-0).
ENGL 577. *Studies in the English Language.* ★3 (either term, 3-0-0).
ENGL 584. *Creative Writing.* ★6 (3-0-0).
ENGL 586. *Studies in American Literature.* ★3 (either term, 3-0-0).
ENGL 587. *Nineteenth Century American Literature.* ★6 (3-0-0).
ENGL 589. *Twentieth Century American Literature.* ★6 (3-0-0).
ENGL 590. *Canadian Literature.* ★6 (3-0-0).
ENGL 591. *Studies in Canadian Literature.* ★3 (either term, 3-0-0).
ENGL 592. *Old Norse Literature.* ★6 (3-0-0).
ENGL 610. *Old English Literature.* ★6 (3-0-0).
ENGL 611. *Studies in Old English Literature.* ★3 (either term, 3-0-0).
ENGL 614. *Middle English Literature.* ★6 (3-0-0).
ENGL 615. *Studies in Middle English Literature.* ★3 (either term, 3-0-0).
ENGL 616. *Chaucer.* ★6 (3-0-0).
ENGL 628. *Medieval Drama.* ★6 (3-0-0).
ENGL 634. *Renaissance Literature.* ★6 (3-0-0).
ENGL 635. *Studies in Renaissance Literature.* ★3 (either term, 3-0-0).
ENGL 640. *Shakespeare.* ★6 (3-0-0).
ENGL 641. *Elizabethan and Jacobean Drama.* ★6 (3-0-0).
ENGL 646. *Seventeenth Century Poetry and Prose.* ★6 (3-0-0).
ENGL 647. *Studies in Seventeenth Century Literature.* ★3 (either term, 3-0-0).
ENGL 652. *Milton.* ★6 (3-0-0).
ENGL 654. *Restoration and Eighteenth Century Drama.* ★6 (3-0-0).
ENGL 658. *Restoration and Eighteenth Century Literature.* ★6 (3-0-0).
ENGL 659. *Studies in Restoration and Eighteenth Century Literature.* ★3 (either term, 3-0-0).
ENGL 660. *The Eighteenth Century Novel.* ★6 (3-0-0).
ENGL 662. *The Romantic Novel.* ★6 (3-0-0).
ENGL 663. *Romantic Literature.* ★6 (3-0-0).
ENGL 664. *Romantic Poetry.* ★6 (3-0-0).
ENGL 665. *Studies in Romantic Literature.* ★3 (either term, 3-0-0).
ENGL 670. *Currents of Thought in English Literature since 1790.* ★6 (3-0-0).
ENGL 671. *Victorian Poetry.* ★6 (3-0-0).
ENGL 672. *The Victorian Novel.* ★6 (3-0-0).
ENGL 673. *Studies in Victorian Literature.* ★3 (either term, 3-0-0).
ENGL 676. *The Twentieth Century Novel.* ★6 (3-0-0).
ENGL 678. *Twentieth Century Prose.* ★6 (3-0-0).
ENGL 679. *Studies in Twentieth Century Literature.* ★3 (either term, 3-0-0).
ENGL 682. *Twentieth Century Poetry.* ★6 (3-0-0).
ENGL 684. *Twentieth Century Drama.* ★6 (3-0-0).
ENGL 692. *Technique of the Novel.* ★6 (3-0-0).
ENGL 693. *Studies in Literary Genres.* ★3 (either term, 3-0-0).
ENGL 694. *Studies in Literary Techniques.* ★3 (either term, 3-0-0).
ENGL 695. *Studies in Literary Themes.* ★3 (either term, 3-0-0).
ENGL 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0).

204.31 Entomology

204.31.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Entomology offers program degrees of M.Sc. and Ph.D. Laboratory space is available for about twenty-five students.

(2) For research in taxonomy, the Department maintains an extensive collection of specimens and a library of reprints. There is basic equipment for study and experiment in morphology, physiology, biochemistry, ecology, and applied entomology. Two scanning electron microscopes are housed in the Department.

(3) Programs may include Entomology 317, 401, 407, 419, 427, 450, 471, 476, 480, 492, 527, 556, 560, 561, 610, 621, 650, 660, 670, 680, and 692 together with appropriate courses offered by other departments. The general regulations for the M.Sc. and Ph.D. degrees apply. All students are required to take Entomology 601 and Entomology 602 each year.

(4) In the Ph.D. program, before the student takes the candidacy examination, he/she shall satisfy the committee that he/she possesses a knowledge of French or suitable foreign language.

(5) Inquiries should be directed to the Chairman of the Department.

204.31.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

ENT 401. *Project in Basic Entomology.* Weight according to work done to a maximum of ★6. Individual study. Course object: to provide students with the opportunity to investigate through guided reading and discussion with a faculty member of their choice, the literature on one or more topics in basic entomology. According to circumstances and inclinations, limited experimental work might be undertaken.

ENT 407. *Principles of Insect Pest Management.* ★3 (Second Term, 3-1s-0). The ecological, economic and tactical concepts involved in insect pest management. Prerequisite: Any entomology course or ZOOL 352, 353, or FOR 380.

ENT 419. *Insect Development.* ★3 (Second Term, 3-0-3). Reproduction, embryonic and postembryonic development in insects. Prerequisite: Consent of instructor. ENT 317 recommended.

ENT 427. *Insect Taxonomy.* ★4 (First Term, 2-0-6). The higher taxa of insects and their relationships. Practice in identification. Prerequisites: Consent of instructor. ENT 317 recommended.

ENT 450. *Insect Biochemistry.* ★3 (First Term, 3-0-3). Comparative biochemistry of insects emphasizing processes which are characteristic of insects. Prerequisites: BIOCH 300 or 372, or PL SC 431 and 432; ENT 207 or 302 recommended.

ENT 471. *Project in Applied Entomology.* Weight according to work done to a maximum of ★6. A survey of the literature on one or more topics in applied entomology with or without an experimental study of related simple problems.

ENT 476. *Insect Toxicology.* ★3 (Second Term, 3-1s-2). Survey of present and prospective chemical insect control agents. Chemistry, mode of action, metabolism, environmental impact and hazards to man of insecticides, repellants, microbial agents, chemosteriliants, insect growth regulators and chemicals which influence insect behaviour. Prerequisites: CHEM 250 and one of ENT 207, 302, 392, 480, 492 or FOR 380.

ENT 480. *Forest Entomology.* ★3 (either term, 3-1s-2). Characteristics of major North American forest insects. Roles of insects in forest ecosystems. Insects destructive to wood and wood products. Principles of control. This course is intended for honors and graduate students in Entomology or any other biological science. A term paper is required. Given concurrently with FOR 380. Prerequisite: Biology 30 or BIOL 130 or equivalent. Not open to students with credit in FOR 380.

ENT 492. *Medical and Veterinary Entomology.* ★3 (either term, 3-1s-3). This course is Entomology 392 plus readings and discussion of topics of current interest. Prerequisite: Consent of the instructor. Not open to students with credit in ENT 392.

204.31.3 GRADUATE COURSES

THES 000. *Thesis.*

ENT 527. *Insect Taxonomy.* ★3 (Second Term, 3-0-3). Literature of insect taxonomy. Principles and procedures. Speciation, phylogeny and zoogeography. Preparation of taxonomic papers. Prerequisite: Consent of instructor. ENT 427 recommended.

ENT 556. *Insect Physiology.* ★4 (Second Term, 2-0-5). Life processes illustrated by insects with emphasis on those peculiar to them and their relatives. Prerequisite: Consent of the instructor. A senior physiology course recommended.

ENT 560. *Insect Ecology.* ★4 (First Term, 2-0-6). Relationships of insects to their environment. Community interactions. Laboratory will consist of field trips. Prerequisite: ENT 207 or ENT 302 recommended.

ENT 561. *Advanced Insect Ecology.* ★4 (Second Term, 2-0-6). Behavioral aspects of insect ecology. Responses of insects to the biological and physical environment. Circadian activity rhythyms. Prerequisite: ENT 560 recommended.

ENT 601. *Seminar.* ★2 (First Term, 0-2s-0). Required of all graduate students in each year.

ENT 602. *Seminar.* ★2 (Second Term, 0-2s-0). Required of all graduate students in each year.

ENT 610. *Project in Insect Morphology and Histology.* Weight according to work done to a maximum of ★6. Continuing from Entomology 419 including a detailed study of internal structure. Prerequisite: Consent of instructor.

ENT 621. *Project in Insect Taxonomy.* Weight according to work done to a maximum of ★6. Classification and biology of, and literature on, one or more of the major orders. Prerequisite: Consent of instructor.

ENT 650. *Project in Insect Physiology.* Weight according to work done to a maximum of ★6. A review and interpretation of literature on a selected topic with an experimental study of a related problem. Prerequisite: ENT 450 or 556.

ENT 660. *Project in Insect Ecology.* Weight according to work done to a maximum of ★6. Research problems assigned to or chosen by the student on any aspect of insect ecology. Experimental work stressed. Prerequisite: ENT 560 or 561 recommended.

ENT 670. *Project in Insect Toxicology.* Weight according to work done to a maximum of ★6. A review and interpretation of literature on a selected topic with an experimental study of a related problem. Prerequisite: ENT 476.

ENT 680. *Project in Forest Entomology.* Weight according to work done to a maximum of ★6. A review and interpretation of literature on a selected topic and an experimental study of a related problem. Prerequisite: FOR 380 or ENT 480 recommended.

ENT 692. *Project in Medical Entomology.* Weight according to work done to a maximum of ★6. A review and interpretation of literature on a selected topic and an experimental study of a related problem. Prerequisite: Consent of the instructor.

204.32 Food Science

204.32.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Food Science offers programs leading to the degrees of M.Sc., M.Eng. (Food Process Engineering), and Ph.D. (See § 203/Degree Regulations.)

(2) The fields of study open for research in the Department are Food Chemistry, Food Microbiology, Food Processing and Food Engineering.

(3) Senior and advanced courses offered by other departments may be acceptable as part of the graduate program in consultation with the Chairman of the Department of Food Science.

(4) Prospective candidates should consult the Chairman of the Department regarding research facilities and course requirements. Graduate assistantships and demonstratorships are available.

204.32.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

FD SC 402. *Quality Control.* ★3 (Second Term, 3-0-3).

FD SC 453. *Unit Operations in Food Processing I.* ★3 (First Term, 3-0-3).

FD SC 454. *Unit Operations in Food Processing II.* ★3 (Second Term, 3-0-3).

FD SC 461. *Food Microbiology I.* ★3 (First Term, 3-0-3).

FD SC 462. *Food Microbiology II.* ★3 (Second Term, 3-0-3).

FD SC 471. *Food Chemistry I.* ★3 (First Term, 3-0-3).

FD SC 472. *Food Chemistry II.* ★3 (Second Term, 3-0-0).

204.32.3 GRADUATE COURSES

THES 000. *Thesis.*

FD SC 500. *Sensory Analysis of Foods.* ★2 (Second Term, 1-0-2).

FD SC 502. *Brewing and Enology.* ★3 (Second Term, 3-0-0).

FD SC 503. *Milk and Dairy Products.* ★3 (Second Term, 3-0-3).

FD SC 504. *Meat and Meat Products.* ★3 (First Term, 3-0-3).

FD SC 505. *Fruit and Vegetable Products.* ★3 (First Term, 3-0-3).

FD SC 506. *Cereal and Oil Seed Products.* ★3 (First Term, 3-0-3).

FD SC 530. *Food Product/Process Development.* ★6 (both terms, 0-2s-4).

FD SC 552. *Food Protein Technology.* ★3 (Second Term, 2-0-4).

FD SC 554. *Food Processing Project.* ★3 (either term, 1-0-5).

FD SC 566. *Advanced Food Microbiology.* ★3 (Second Term, 1-0-4).
FD SC 573. *Food Analysis.* ★3 (Second Term, 3-0-3).
FD SC 583. *Food Rheology.* ★2 (either term, 1-0-2).
FD SC 586. *Food Process Evaluation.* ★3 (First Term, 3-3s-0).
FD SC 587. *Food Engineering Laboratory.* ★3 (either term, 1-0-3).
FD SC 588. *Heat and Mass Transfer in Food Engineering.* ★3 (First Term, 3-0-0).
FD SC 600. *Seminar.* ★1 (both terms, 0-1s-0).
FD SC 601. *Topics in Food Science.* ★3 (either term, 0-3s-0).
FD SC 660. *Advanced Applied Microbiology.* ★3 (either term, 3-0-0).
FD SC 671. *Advanced Food Chemistry.* ★3 (either term, 3-0-0).
FD SC 900. *Non-Thesis Project.* ★3 (variable).

204.33 Forest Science

204.33.1 THE DEGREE OF M.SC.

(1) The Department of Forest Science offers a program leading to the degree of Master of Science, as well as a specialization leading to the degree of Master of Science (Wildland Recreation).

(2) Fields of interest in the Department of Forest Science include: forest resource management, forest mensuration / biometrics, forest biology, forest fire management, forest hydrology, and wildland recreation and interpretation.

(3) Entrance requirement is normally a B.Sc. in Forestry or its equivalent, although flexibility is possible in developing programs for applicants with other qualifications.

(4) Course requirements are based on the student's previous training and anticipated needs in this field of specialization. Minimum requirements are six half-year courses acceptable for graduate credit, plus a thesis equivalent to at least four half-year courses. All students must participate in the Forestry Seminar (FOR 600) each term, and must take an advanced statistics and / or experimental design course. Acceptable courses may be drawn from these listed for the Department of Forest Science, and from other departments within the University.

(5) The time required to complete a M.Sc. program varies according to the undergraduate training of the student and the nature of research undertaken. Normally two academic years plus a summer of research, or one academic year and two summers of research are needed.

(6) Financial assistance from research grants is available for some candidates.

(7) Prospective students are invited to direct their inquiries to the Chairman, Department of Forest Science.

204.33.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

FOR 410. *Remote Sensing for Renewable Resource Inventory and Management.* ★3 (First Term, 3-0-3).
FOR 411. *Forest Management Inventory and Planning.* ★3 (First Term, 3-0-3).
FOR 412. *Forest Regulation.* ★3 (Second Term, 3-0-3).
FOR 415. *Advanced Dendrology.* ★3 (Second Term, 3-0-0). Offered alternate years.
FOR 417. *Tree Seed Handling.* ★3 (Second Term, 1½-0-3). Offered alternate years.
FOR 422. *Forest Tree Improvement.* ★3 (Second Term, 3-0-3). Offered alternate years.
FOR 427. *Tree Physiology.* ★3 (First Term, 3-0-3). Offered alternate years.
FOR 430. *Forest Resources Management I.* ★3 (First Term, 3-0-3).
FOR 431. *Forest Resources Management II.* ★3 (Second Term, 3-0-3).
FOR 450. *Forest and Range Hydrology.* ★3 (Second Term, 3-0-3).
FOR 452. *Forest Watershed Management.* ★3 (First Term, 3-0-3).
FOR 462. *Wildland Recreation Management.* ★3 (First Term, 3-0-3).
FOR 463. *Wildland Recreation Planning.* ★3 (Second Term, 3-0-0).
INT D 432. *Forest Administration and Policy.* ★3 (Second Term, 2-1s-0).
INT D 467. *Methods in Heritage Interpretation.* ★3 (Second Term, 3-0-0).
INT D 470. *Heritage Interpretation Field Trip.* ★3 (Spring Session, Second Term, 0-2-6).

204.33.3 GRADUATE COURSES

THES 000. *Thesis.*
FOR 500. *Research Methods in Forestry.* ★3 (Second Term, 3-0-0).
FOR 502. *Reading Projects in Forestry.* Weight according to work done to a maximum of ★6.
FOR 503. *Advanced Problems in Forestry.* Weight according to work done to a maximum of ★6.
FOR 511. *Advanced Forest Biometrics.* ★3 (Second Term, 3-0-3).
FOR 517. *Advanced Silviculture.* ★3 (Second Term, 3-0-3). Offered alternate years.
FOR 520. *Problems in Silviculture.* ★3 (either term, 3-0-0).
FOR 522. *Seminar in Tree Improvement.* ★3 (Second Term, 0-3s-0).
FOR 525. *Problems in Forest Ecology.* ★3 (either term, variable).
FOR 526. *Advanced Forest Ecology.* ★3 (Second Term, 3-0-0). Offered in alternate years.
FOR 535. *Problems in Forest Resources Management.* ★3 (either term, variable).
FOR 545. *Problems in Forest Fire Management.* ★3 (either term, variable).
FOR 546. *Advanced Fire Ecology.* ★3 (First Term, 3-0-0).
FOR 555. *Problems in Forest Hydrology.* ★3 (either term, variable).
FOR 565. *Problems in Forest Recreation.* ★3 (either term, variable).
FOR 600. *Forestry Seminar.* ★3 (0-1½s-0).
FOR 699. *Forestry Problems.* Weight according to work done up to a maximum of ★6.

204.34 Genetics

204.34.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Genetics offers programs leading to the Master of Science and Doctor of Philosophy degrees.

(2) Current research activities in the Department are in the areas of mutagenesis, genetic recombination, population genetics, developmental genetics, molecular genetics, plant genetics and cytogenetics. There is some opportunity for research in conjunction with associate members of the Department.

(3) Eligible applicants will be admitted for graduate work only if facilities are available for the project they propose to undertake.

(4) Normally all senior courses are acceptable in the graduate program. Course requirements for individual students are based on their previous training and anti-

cipated needs in their chosen field of research. Students are expected to take an assessment examination towards the end of their first year. Graduate students are not required to take a language other than English for the M.Sc. and Ph.D. degrees.

(5) A minimum of two years is normally required for the master's degree and somewhat longer for the doctoral program. The department generally considers that a satisfactory student should be able to complete a M.Sc. degree in a period of three years, and a Ph.D. in a period of five years, although these times are somewhat less than the absolute restriction imposed by the University.

(6) Financial assistance is available for some students and it is awarded on the basis of merit.

(7) Inquiries should be directed to the Chairman, Department of Genetics.

204.34.2 GRADUATE COURSES

The following courses may be taken for graduate credit:

THES 000. *Thesis.*

GENET 410. *Genetics of Industrially Important Fungi.* ★3 (Second Term, 3-0-0).

GENET 415. *Cytogenetics.* ★3 (Second Term, 3-2s-0).

GENET 419. *Quantitative Genetics.* ★3 (Second Term, 3-0-0).

GENET 430. *Recombination and Mutation.* ★3 (First Term, 3-2s-0).

GENET 445. *Molecular Genetics.* ★3 (Second Term, 3-0-0).

GENET 452. *Radiation Genetics.* ★3 (Second Term, 3-0-0).

GENET 463. *Genetic Improvement of Cultivated Plants.* ★3 (Second Term, 3-0-0).

GENET 465. *Human Population Genetics.* ★3 (Second Term, 3-1s-0).

GENET 470. *Immunogenetics.* ★3 (First Term, 3-0-0).

GENET 481. *Population Genetics.* ★3 (Second Term, 3-2s-0).

GENET 486. *Developmental and Physiological Genetics.* ★3 (First Term, 3-1s-0).

GENET 506. *Reading Project.* ★3. (0-0-6).

GENET 507. *Research Project.* ★3. (0-0-6).

GENET 511. *Cytology.* ★3 (First Term, 3-0-0).

GENET 520. *Research Techniques in Molecular Genetics.* ★6 (Second Term, 0-0-6).

GENET 521. *Research Techniques in Classical and Molecular Cytogenetics.* ★6 (Second Term, 0-0-6).

GENET 546. *Current Topics in Molecular Genetics.* ★3 (Second Term, 3-0-0).

GENET 581. *Topics in Population Genetics.* ★3 (Second Term, 3-0-0).

GENET 587. *Genetics and Development.* ★3 (Second Term, 3-0-0).

GENET 601. *Genetics Seminar.* ★6 (0-1s-0). Required of all graduate students in Genetics.

204.35 Geography

204.35.1 THE DEGREES OF M.A., M.SC. AND PH.D.

(1) The Department of Geography offers the degrees of Master of Arts, Master of Science, and Doctor of Philosophy. Graduate work for each of these degrees includes presentation of an acceptable thesis.

(2) The Department will approve only thesis topics which lie within the research specialty of one or more of its staff members.

(3) Entrance requirements are as laid down in the general regulations of this Calendar.

(4) M.A. and M.Sc. candidates' programs will be prepared under the general regulations for the master's degree. A reading knowledge of a foreign language is not a formal requirement, although candidates may be required to obtain a language skill if it is appropriate to their particular programs. In addition, the Department cooperates with the Departments of Civil Engineering and Geology in a joint program leading to the degree of M.Sc. in Geomorphology.

(5) Ph.D. candidates' programs will be prepared under the general regulations for that degree. A reading knowledge of foreign languages is not a formal requirement although candidates may be required to obtain language skills if these are appropriate to their particular programs.

(6) A number of assistantships are available for qualified students, both through University funds and through research funds at the disposal of the Department.

204.35.2 GRADUATE COURSES

THES 000. *Thesis.*

Geography

GEOG 500. *History and Nature of Geography.* ★3 (Second Term, 0-3s-0).

GEOG 501. *Air Photo Interpretation.* ★6 (3-0-3).

GEOG 502. *Reading and Seminar Course.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 506. *Scandinavia.* ★6 (0-3s-0).

GEOG 509. *Field Techniques in Physical Geography.* ★3 (First Term, 0-3s-0).

GEOG 510. *Historical Geography.* ★3 (First Term, 0-3s-0).

GEOG 523. *Geographic Theory.* ★3 (First Term, 3-0-0).

GEOG 529. *Application of Quantitative Methods and Computer Programming in Geography.* ★3 (Second Term, 0-3s-0).

GEOG 530. *Advanced Fluvial Geomorphology.* ★3 (either term, 0-3s-0).

GEOG 531. *Advanced Glacial Geomorphology.* ★3 (either term, 0-3s-0).

GEOG 532. *Periglacial Geomorphology.* ★3 (either term, 0-3s-0).

GEOG 533. *Climatology.* ★3 (First Term, 3-0-0).

GEOG 534. *Slope Morphology.* ★3 (either term, 0-3s-0).

GEOG 535. *Advanced Northern Lands.* ★3 (Second Term, 0-3s-0).

GEOG 536. *Karst Geomorphology.* ★3 (either term, 0-3s-0).

GEOG 537. *Circumpolar Quaternary Climates.* ★3 (Second Term, 0-3s-0).

GEOG 539. *Seminar in Natural Hazards.* ★3 (either term, 0-3s-0).

GEOG 542. *Seminar in the Geography of Latin America.* ★3 (Second Term, 0-3s-0).

GEOG 544. *Seminar on Africa.* ★6 (0-3s-0).

INT D 546. *East European and Soviet Studies.* ★6 (3-0-0).

GEOG 548. *Seminar on the Human Geography of East Central Europe.* ★3 (Second Term, 0-3s-0).

GEOG 550. *Research in Regional Geography.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 551. *Research in Physical Geography.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 552. *Research in Human Geography.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 553. *Special Research Problems.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 554. *Advanced Population Geography.* ★3 (Second Term, 3-0-0).

GEOG 558. *Research on Transportation Geography.* ★3 (Second Term, 3-0-0).

GEOG 559. *Perception Research in Geography.* ★3 (either term, 3-0-0).

GEOG 560. *Rural Development and Planning.* ★6 (0-3s-0).

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). An examination of current environmental research in the Canadian North. Seminars are presented by professionals engaged in various facets of northern research. Prerequisite: Consent of the Department. (Offered by the Boreal Institute for Northern Studies and the Department of Geography.) [Geography]

GEOG 565. *Environmental Quality.* ★3 (First Term, 0-3s-0).

GEOG 566. *Geography of Outdoor Recreation.* ★3 (Second Term, 0-3s-0).

GEOG 568. *Water Resources I.* ★3 (First Term, 0-3s-0).

GEOG 569. *Water Resources II.* ★3 (Second Term, 0-3s-0).

GEOG 580. *Seminar on Geography of Settlement.* ★6 (0-3s-0).

GEOG 581. *Physical Structure of the City.* ★3 (First Term, 0-3s-0).

GEOG 582. *Social Geography of the City.* ★3 (Second Term, 0-3s-0).

GEOG 584. *The Geography of Market Centers and Marketing.* ★3 (Second Term, 3-0-0).

GEOG 588. *Political Urban Geography.* ★3 (First Term, 0-3s-0).

GEOG 589. *Urban Land Use Planning.* ★3 (Second Term, 0-3s-0).

GEOG 630. *Advanced Research in Regional Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GEOG 631. *Advanced Research in Physical Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). (See § 44.22 Arts and Science Calendar.)

GEOG 680. *Advanced Research in Human Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GEOG 681. *Advanced Research in Urban Geography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GEOG 690. *Seminar on Geographic Thought.* ★3 (either term, 0-3s-0) or ★6 (0-3s-0).

GEOG 696. *Special Problems.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

Cartography

CART 411. *Data Handling and Computer Graphics for Mapping.* ★3 (First Term, 1-0-3).

CART 421. *Cartographic Editing.* ★3 (First Term, 3-0-0).

CART 431. *Workshop in Cartographic Reproduction.* ★3 (Second Term, 1-0-3).

CART 451. *Analytical Cartography.* ★3 (Second Term, 3-0-0).

CART 461. *History of Map Making.* ★3 (Second Term, 3-0-0).

CART 511. *Problems in Cartography.* ★3 (First Term, 0-3s-0).

CART 521. *Proseminar in Cartography.* ★3 (Second Term, 0-3s-0).

CART 601. *Advanced Cartography.* ★3 or ★6.

204.36 Geology

204.36.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Geology has research laboratories and instructional facilities for at least fifty resident graduate students proceeding to the M.Sc. and Ph.D. degrees.

(2) The active research fields include mineralogy, igneous and metamorphic petrology, geochemistry, geochronology, isotope geology, metalliferous mineral deposits, volcanology, experimental petrology, sedimentology, stratigraphy, coal and petroleum geology, invertebrate and vertebrate paleontology, engineering geology, Quaternary and glacial geology, geostatistics, hydrogeology, geotectonics and structural geology.

(3) An M.Sc. program should normally be completed by 1-2 academic years of work beyond a 4-year honours or specialization degree at The University of Alberta or its equivalent at another institution. Requirements for the degree include satisfactory completion of a thesis and at least three single-term courses.

(4) A Ph.D. program should normally be completed by 3-4 academic years of work beyond the M.Sc. degree in geology. The essential requirement for the degree is the planning, carrying out and writing up of research of high quality. A candidacy examination is taken as soon as possible , normally 8-12 months, after admission to the program, in order to ensure that a student has the necessary knowledge, background and ability to complete a Ph.D. thesis. Normally, before taking the candidacy examination a student will have credit in at least eight single-term courses beyond the 4-year baccalaureate degree. A knowledge of languages other than English may also be required.

(5) In addition to scholarships administered by the University, a number of Graduate Assistantships are awarded by the Department.

(6) Inquiries should be made to the Graduate Advisor, Department of Geology, University of Alberta, Edmonton, Alberta, T6G 2E3. Telephone (403) 432-3265.

204.36.2 THE POSTGRADUATE DIPLOMA IN EXPLORATION GEOLOGY

The Department of Geology has a program of studies leading to the Postgraduate Diploma in Exploration Geology. The program is designed to meet the needs of (1) earth scientists wishing to switch into coal, mineral or petroleum exploration, (2) exploration geologists with several years of experience who want to bring themselves up to date, and (3) graduate geologists from overseas who under the auspices of foreign aid wish to become familiar with the latest developments in exploration geology. Each program is individually tailored to suit a person's academic background, experience and interests, must contain at least seven half-year courses, and can be completed in two four-month terms. Admission to the program requires some industrial experience as well as a four-year degree in Geology, Geophysics or Mineral Engineering from The University of Alberta or an equivalent qualification from another institution.

204.36.3 GRADUATE COURSES

THES 000. *Thesis.*

GEOL 523. *Subsurface Geologic Methods.* ★3 (Second Term, 3-0-3). Methods of acquiring geologic data from beneath the surface by remote means; drilling, sampling, coring, logging; significance of geophysical techniques; presentation of subsurface information. Prerequisites: GEOL 320 and 362. Formerly GEOL 423.

GEOL 524. *Petroleum Geology I.* ★3 (First Term, 3-0-3). Origin and accumulation of petroleum hydrocarbons; stratigraphic and geographic distribution of oil and gas deposits; petroleum exploration; case histories. Prerequisites: GEOL 362, 420 or 421.

GEOL 525. *Petroleum Geology II.* ★3 (Second Term, 3-0-0). Characteristics of classic oil and gas provinces and fields; geologic analysis of sedimentary basins; economics of petroleum; case histories. Prerequisite: GEOL 524.

GEOL 526. *Coal and Industrial Minerals.* ★3 (First Term, 3-0-3). Composition and origin of coal; diagenesis and metamorphism; macrolithotypes and macerals; coal analysis, classification and uses; coal resources and reserves; occurrence, origin and use of nonmetalliferous industrial rocks and minerals. Prerequisites: GEOL 446 and 460.

†GEOL 528. *Precambrian Geology.* ★3 (Second Term, 0-3s-0). Precambrian geologic record with special reference to the stratigraphy, structure, petrology, mineral deposits, geochronology and metamorphism of the Canadian Shield and Western Canada Cordillera. Prerequisites: GEOL 420 and 447.

†GEOL 530. *Rock-Forming Minerals.* ★3 (Second Term, 3-0-3). Structure, composition, optical and physical properties, phase relationships and paragenesis of important rock-forming minerals and mineral groups. Prerequisite: GEOL 430.

GEOL 532. *Metalliferous Mineral Deposits.* ★3 (First Term, 3-0-3). An introduction to the geologic characteristics and distribution of the principal metalliferous deposits. Prerequisites: GEOL 445, 446, 460. Corequisite: GEOL 447.

GEOL 533. *Ore Petrology.* ★3 (Second Term, 3-0-3). Mineralogy and petrogenesis of metalliferous deposits; mechanism of hydrothermal transport and deposition; metamorphic and igneous processes of ore segregation and modification; the application of isotope data to the study of ores. Prerequisite: GEOL 532.

GEOL 534. *Geology of Nuclear Fuel Resources.* ★3 (Second Term, 3-0-0). Geology and genesis of uranium and thorium deposits in sedimentary, igneous and metamorphic environments; uranium and thorium geochemistry and mineralogy; nuclear power and nuclear resource economics in the future; geochemical methods in nuclear resource exploration; distribution of nuclear resources in time and space. Prerequisite: GEOL 532.

GEOL 546. *Sedimentary Petrology.* ★3 (Second Term, 3-0-3). Processes of clastic and chemical sedimentation, and diagenesis; sedimentary environments and facies; laboratory techniques in the study of sedimentary rocks. Prerequisite: GEOL 446.

GEOL 547. *Petrogenesis of Igneous and Metamorphic Rocks.* ★3 (Second Term, 3-0-3). Origin and formation of igneous and metamorphic rocks in the light of field, mineralogical, chemical and experimental evidence. Prerequisites or corequisites: GEOL 445, 447, 452.

GEOL 553. *Geochemistry II.* ★3 (Second Term, 3-0-3). Physiochemical principles and thermodynamics developed in a geological context, theoretical phase equilibria in sedimentary, metamorphic and igneous rock systems. Prerequisite: GEOL 452.

†GEOL 563. *Structural Geology II.* ★3 (Second Term, 3-0-3). Numerical geometric analysis; analysis of strain; structural associations. Prerequisite: GEOL 460.

GEOL 570. *Geotectonics.* ★3 (Second Term, 3-0-0). Composition and nature of the earth's crust and mantle; ocean basins, ridges and trenches; continental shield areas and orogenic belts; the general theory of plate tectonics and its application to crustal process. Prerequisite or Corequisite: GEOL 447, 460.

GEOL 580. *Geostatistics I.* ★3 (First Term, 3-0-3). An introduction to the philosophy and rudimentary aspects of the application of basic quantitative methods to the analysis of geological data. Prerequisites: GEOL 380, 420 or 421, 445 and 446.

GEOL 581. *Geostatistics II.* ★3 (Second Term, 3-0-3). The application of multivariate quantitative methods to the analysis of geological problems. Prerequisite: GEOL 580 or its equivalent or consent of the instructor.

GEOL 582. *Selected Topics in Glacial Geology.* ★3 (either term, 0-3s-0). Prerequisites: GEOL 380 and 482 or consent of the Department.

GEOL 588. *Hydrogeology.* ★3 (First Term, 3-0-3). Occurrence, distribution, movement and chemistry of groundwater as a function of the geological environment; groundwater as a geologic agent; methods of collection, organization and use of hydrogeologic data; groundwater budgets, model studies, selected problems and case histories. Prerequisites: GEOL 380 and MATH 204.

GEOL 592. *Photogeology and Remote Sensing.* ★3 (First Term, 3-0-3). Application of aerial photographs to geologic mapping and terrain analysis; interpretation of geological structure and landforms; remote sensing in geology; sensor principles and capabilities; analysis of imagery. Prerequisite: Consent of the Department.

GEOL 601. *Environmental Geology.* ★3 (Second Term, 3-0-0).

GEOL 607. *Geologic Research.* ★3 (either term, 0-0-8).

GEOL 612. *Advanced Micropaleontology.* ★3 (either term, 4-2s-0).

GEOL 616. *Palynology.* ★3 (either term, 3-3s-0).

GEOL 622. *Advanced Stratigraphy.* ★6 (3-0-3).

GEOL 624. *Advanced Sedimentology.* ★6 (0-3s-0).

GEOL 626. *Fossil Energy Resources.* ★3 (either term, 0-3s-0).

GEOL 631. *Mineralogy Seminar.* ★3 (either term, 0-3s-0).

GEOL 632. *Advanced Ore Petrogenesis.* ★3 (Second Term, 0-3s-0).

GEOL 633. *Economic Geology.* ★3 (Second Term, 3-0-0). The economics of exploration and exploitation with respect to metalliferous raw materials. Exploration logistics and planning. Property evaluation. Drilling and sampling techniques. Reserve and grade estimation.

GEOL 639. *Theory and Practice of Electron Microbeam Analysis.* ★3 (First Term, 3-0-3). Instrumentation, theory and applications in the Earth Sciences, with particular reference to electron microprobe analysis.

GEOL 640. *Chemical Petrology.* ★3 (Second Term, 2-2s-0).

GEOL 644. *Selected Topics in Petrology.* ★3 (First Term, 0-3s-0).

GEOL 646. *Advanced Sedimentary Petrography.* ★3 (First Term, 1-0-3).

GEOL 647. *Advanced Metamorphic Petrology.* ★3 (First Term, 0-3s-0).

GEOL 650. *Advanced Geochemistry.* ★3 (Second Term, 0-3s-0).

GEOL 654. *Isotope Geology: Radioactive Systems.* ★3 (First Term, 3-0-0).

GEOL 655. *Isotope Geology: Stable Isotope Fractionation.* ★3 (Second Term, 3-0-0).

GEOL 660. *Advanced Structural Geology.* ★3 (First Term, 3-0-0).

GEOL 661. *Regional Structural Geology.* ★3 (First Term, 3-0-3).

GEOL 680. *Quantitative Geomorphology.* ★3 (either term, 3-0-3).

GEOL 681. *Selected Topics in Geostatistics.* ★3 (either term, 0-3s-0).

GEOL 683. *Selected Topics in Quarternary Geology.* ★3 (First Term, 0-3s-0). Prerequisite: GEOL 482 or consent of the Department.

GEOL 684. *Deposits in Permafrost Regions.* ★3 (Second Term, 0-3s-0). Analysis and applied aspects of surficial deposits in permafrost regions.

GEOL 686. *Quantitative Hydrogeology.* ★3 (either term, 0-3s-0).

GEOL 687. *Selected Topics in Hydrogeology.* ★3 (Second Term, 0-3s-0).

NOTE: A list of Paleontology courses and course descriptions may be found under § 204.61 / Paleontology.

204.37 Geophysics

The Department of Physics offers a program leading to the M.Sc. or Ph.D. degree with specialization in solid earth physics and space physics. See § 204.68.1 for a more detailed description of the courses and the program.

204.38 Germanic Languages

204.38.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Germanic Languages offers graduate work leading toward the M.A. and Ph.D. degrees with a concentration in either German Literature or Germanic Linguistics and Philology.

(2) Among the areas for which the Department is especially qualified, through staff and library resources, to direct work leading to graduate degrees, are Germanic philology and linguistics, Medieval Literature, The Age of Goethe, Romanticism, Nineteenth and Twentieth Century Literature. The University Library is especially rich in primary and secondary sources, including periodicals, of the post-naturalistic period and is fortunate in having the *Georg Kaiser Collection* which offers a rare opportunity for research into the life and work of this author, using photocopies of original material much of which is still unpublished.

(3) For the M.A. degree, the admission requirements are those of the Faculty of Graduate Studies and Research.

(4) For admission as a provisional candidate for the Ph.D. degree, in general, The University of Alberta M.A. in German or its equivalent (including *Staatsexamen*) will be required. Students whose ability to write a thesis-length work is untested will be required to write

an extended term paper in one of their graduate courses during the first term of their first year of doctoral studies. Students must also demonstrate their proficiency in oral and written German.

(5) There are two routes leading to the M.A. degree, with thesis and without thesis.

(6) *M.A. with thesis.* In addition to the thesis requirement there are course requirements.

(i) For students with a three-year B.A. six to eight courses are required in a two-year program, the first of which is a qualifying year; for students with a four-year Bachelor's degree normally six courses are required in a two-year program; and for students with a B.A. Honors degree in German three courses are required in a one-year program.

(ii) All candidates for the M.A. with thesis must take German 512, 593, and the non-credit course German 515, unless fulfillment of equivalent requirements can be demonstrated. Each program will be decided upon in consultation with the Department.

(iii) All candidates for the M.A. with thesis are required to take a final oral examination, which is a defense of the thesis.

(7) *M.A. without thesis.* There are course requirements for the M.A. degree without thesis.

(i) For students with a three-year B.A. seven to nine courses are required in a two-year program, the first of which is a qualifying year; for students with a four-year Bachelor's degree normally seven courses are required in a two-year program; and for students with a B.A. Honors degree in German four courses are required in a one-year program.

(ii) All candidates for the M.A. without thesis must take German 512 and the non-credit course German 515, unless fulfillment of equivalent requirements can be demonstrated. Each program will be decided upon in consultation with the Department.

(iii) All candidates for the M.A. without thesis are required to submit an extended term-paper which will be discussed with the candidate by an evaluation committee.

(8) In addition to the dissertation, the requirements for the Ph.D. degree are as follows:

(i) Reading proficiency in an approved language other than German or English.

(ii) In addition to the requirements for the M.A., the equivalents of six full-year courses. In each case, the student's program will be decided upon in consultation with the Department.

(iii) The candidacy examination consisting of a department written examination and a Faculty oral examination.

(iv) The final oral examination, which is a defense of the dissertation.

(9) Financial assistance is available in the form of fellowships and Graduate Assistantships.

(10) For further information contact the Chairman of the Department.

204.38.2 GRADUATE COURSES GERMAN

The following list represents the graduate course and seminar offerings of the Department from which a selection will be made for a given year.

All registrations must be approved by the Department.

Courses and/or seminars marked ★3 or ★6 carry a course weight of either 3 or 6 depending on whether the length of the course and/or seminar is one or two terms.

THES 000. *Thesis.*

GERM 500. *Reading Course.* ★6 (3-0-0). This course is designed for graduate students who wish to satisfy the language requirement of their department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own fields. Note: Not open to undergraduates.

GERM 511. *Composition and Conversation.* ★3 (First Term 3-0-0).

GERM 512. *Advanced Composition and Conversation.* ★3 (Second Term, 3-0-0). Advanced written and oral practice involving difficult problems of grammar idioms and style. Required of Honors students and those Graduate students selected on the basis of a test.

GERM 515. *Teaching Strategies for College and University Teachers.* ★0 (1-0-2). Aims and objectives, methods and technological aids, psychology of teaching and learning relevant to language teaching. Tests and test administration. Required of all Graduate students, unless its equivalent has already been taken.

GERM 520. *Cultural and Political Topics in German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 540. *Old High German.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 550. *Gothic.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 560. *History of the German Language.* ★3 (either term 3-0-0) or ★6 (3-0-0).

GERM 580. *Comparative Germanic Grammar.* ★3 (either term 3-0-0) or ★6 (3-0-0).

GERM 590. *Old Saxon.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 593. *Bibliography and Methods of Literary Scholarship.* ★3 (First Term, 3-0-0).

GERM 603. *Early Middle High German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 604. *Studies in Middle High German Lyric Verse.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 605. *The Nibelungenlied.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 606. *Hartmann von Aue.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 607. *Wolfram von Eschenbach.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 609. *Gottfried von Strassburg.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 611. *Walther von der Vogelweide.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 612. *Late Middle High German Literature.* ★3 (either term 3-0-0) or ★6 (3-0-0).

GERM 613. *Early New High German Literature.* ★3 (either term 3-0-0) or ★6 (3-0-0).

GERM 615. *Studies in Seventeenth Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 616. *Studies in Eighteenth Century Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 617. *Lessing.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 618. *Enlightenment.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 619. *Sturm and Drang.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 620. *Classicism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 622. *Goethe.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 624. *Schiller.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 625. *Romanticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 626. *Studies in the Literature of the Age of Goethe.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 635. *Realism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 637. *Naturalism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 639. *Expressionism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 645. *Modern German Literature (up to 1945)* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 650. *Contemporary German Literature (from 1945 to the present).* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 655. *Studies in German Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 665. *Studies in the German Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 675. *Studies in the German Novelle.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 685. *Studies in German Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 696. *Conference Course in Germanic Linguistics and Philology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 697. *Special Topics in Germanic Linguistics and Philology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 698. *Special Topics in German Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

GERM 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Detailed study of an author, period, genre, or any literary problem not dealt with in the honors or graduate courses listed above. Designed to meet the needs of individual Honors or Graduate students.

GERM 900. *Non-Thesis Project.* ★3 (variable).

204.38.3 GRADUATE COURSES SCANDINAVIAN

SCAND 550. *Old Icelandic Philology.* ★6 (3-0-0).

204.39 Health Services Administration

204.39.1 THE DEGREE OF M.H.S.A.

The Division of Health Services Administration, under the direction of the Faculty of Graduate Studies and Research, offers a two-year program leading to the degree Master of Health Services Administration. The student may select either a thesis or a non-thesis route to the degree.

The thesis option emphasizes the development of research and planning expertise relevant to efficient and effective health and social services delivery. The non-thesis option emphasizes the development of administrative expertise relevant to service programs and agencies in the health and welfare fields.

The details of a student's course requirements are determined by the faculty of the Division and consideration is given to the student's prior background of course work and experience as well as their career plans. Each student is expected to develop an area of special interest such as hospitals, nursing service, social welfare, medical care, epidemiology, and so on. Within this framework, the normal Qualifying Year course requirements are as follows:

WINTER SESSION

First Term

H S A 400 Health and Welfare Delivery Systems
H S A 420 Structure and Process in Health and Welfare Service Agencies
H S A 430 Methods and Statistics in Health Services Administration: I

Two of:

H S A 435 Survey of Epidemiology
H S A 450 Health Services Accounting
H S A 470 Introductory Health Care Economics

Second Term

H S A 401 Problems and Issues in Health and Welfare Delivery
H S A 431 Methods and Statistics in Health Services Administration: II

One of:

H S A 421 Management of Health and Welfare Service Agencies.
H S A 513 Nursing Service Administration*

Two of:

H S A 451 Application of Managerial Accounting to Health Service Agencies
H S A 471 Application of Economic Principles to Health Services Administration
H S A 535 Problems and Issues in Epidemiology

MAY-AUGUST SUMMER PERIOD

H S A 499 Field Practicum (four months)

*Alternative courses in mental health services administration, occupational health, home care administration, public health administration, and so on, may be available in any given year, depending on student interest and available faculty resources.

In the Candidacy Year, students in the non-thesis option must complete H S A 600, 601, 900 and six additional half-year courses, or equivalent; thesis option students must complete four to six half-year courses, or equivalent, depending on the scope of the thesis. Normally *all* students must complete at least two of the following pairs of Candidacy Year courses: H S A 530-531. H S A 550-551, H S A 560-561, H S A 570-571.

Consideration may be given to major modifications in the course work outlined above in exceptional circumstances of prior education, work experience, and career interest.

The MHSA program is acceptable to the Council of the Royal College of Physicians and Surgeons of Canada as a portion of the specialty training program in Community Medicine.

Requests for further information should be forwarded to the Director, Division of Health Services Administration, The University of Alberta, 13-103 Clinical Science Building, Edmonton, Alberta. T6G 2G3.

Requirements of Admission

(1) A baccalaureate degree with a grade point average of at least 6.0 in the work of the last two undergraduate years at The University of Alberta, or an equivalent qualification from another institution;

(2) Submission of the results of a Miller Analogies Test;

(3) A statement from the Director of the Division of Health Services Administration (following review of the application) that the applicant is, in all respects, acceptable to the Department.

204.39.2 THE POSTGRADUATE DIPLOMA IN HEALTH SERVICES ADMINISTRATION

The Division of Health Services Administration offers a postgraduate Diploma in Health Services Administration.

The purpose of the diploma is to provide post-baccalaureate educational experience in health services administration to a larger number of health care personnel than is currently possible within the framework of the Master's program in Health Services Administration at The University of Alberta. This program will be of particular interest to health and welfare executives seeking mid-career educational opportunities.

The following policy will govern operation of the Diploma program:

(1) In order to be admissable to the program, the applicant must have had three years experience in an administrative, clinical, or research position in the health or welfare field and must meet all other Faculty of Graduate Studies and Research standards, namely:

(a) a baccalaureate degree with a grade point average of at least 6 in the work of the last two years;
(b) a statement from the director of the Division that the applicant is in all respects acceptable as a student; and
(c) English language proficiency (for all non-Canadians for whom English is not the major language).

(2) The diploma may be completed on a full-time or part-time basis but must be finished within 4 academic years of initial registration. It can be completed in one full-time academic year. Normally, only courses taken within the five years prior to registration may be considered for exemption from the diploma course requirement; no more than two exemptions will normally be allowed.

(3) The course requirements will be:

H S A 400. Health and Welfare Delivery Systems.
H S A 401. Problems and Issues in Health and Welfare Delivery.
H S A 420. Structure and Process in Health and Welfare Service Agencies.

One of:

H S A 421 Management of Health and Welfare Service Agencies.
H S A 513. Nursing Service Administration.

Four of:

H S A 430. Methods and Statistics in Health Services Administration: I.
H S A 431. Methods and Statistics in Health Services Administration: II.
H S A 450. Health Services Accounting.
H S A 451. Application of Managerial Accounting to Health Service Agencies.
H S A 470. Introductory Health Care Economics.
H S A 471. Application of Economic Principles to Health Services Administration.

Plus: Two approved electives which will be either advanced (candidacy year) courses in health services administration or other courses outside the Division which are deemed to be centrally relevant to the career interests and needs of the student because of the specialized knowledge or depth of knowledge which they provide.

(4) Grade requirements for graduation will be the same as those for a Master's degree at The University of Alberta, that is, a grade point average of 6, or better.

(5) Procedures for admission, student review and student discipline will be the responsibility of a Committee of the whole of the full-time Health Services Administration faculty, as it is for Master's students.

204.39.3 GRADUATE COURSES

THES 000. *Thesis.*

It is not intended that the following courses be offered each year; interested individuals should contact the Division of Health Services Administration for scheduling information for the year concerned.

H S A 400 *Health and Welfare Delivery Systems.* ★3 (First Term, 3-0-0).
H S A 401. *Problems and Issues in Health and Welfare Delivery.* ★3 (Second Term, 3-0-0).
H S A 410. *Hospital Organization and Management.* ★3 (Second Term, 3-0-0).
H S A 411. *Medical Care Administration.* ★3 (Second Term, 3-0-0).
H S A 412. *Social Welfare Administration.* ★3 (Second Term, 3-0-0).
H S A 420. *Structure and Process in Health and Welfare Service Agencies.* ★3 (First Term, 3-0-0).
H S A 430. *Methods and Statistics in Health Services Administration: I.* ★3 (First Term, 3-0-0).
H S A 431. *Methods and Statistics in Health Services Administration: II.* ★3 (Second Term, 3-0-0).
H S A 435. *Survey of Epidemiology.* ★3 (First Term, 3-0-0).
H S A 450. *Health Services Accounting.* ★3 (First Term, 3-0-0).
H S A 451. *Application of Managerial Accounting to Health Service Agencies.* ★3 (Second Term, 3-0-0).
H S A 460. *Electronic Data Processing and Computer Utilization for Health Service Administrators.* ★3 (First Term, 3-0-0).
H S A 470. *Introductory Health Care Economics.* ★3 (First Term, 3-0-0).
H S A 471. *Application of Economic Principles to Health Services Administration.* ★3 (Second Term, 3-0-0).
H S A 499. *Field Practicum.* ★6 (May 1-August 31).
H S A 500. *Advanced Problems in Health Care Delivery.* ★3 (3-0-0). Critical analysis and evaluation of contemporary problems and emerging trends in the structure of the health and welfare delivery system in Canada as well as limited cross-cultural comparison of health care delivery systems.
H S A 510. *Advanced Hospital Administration.* ★3 (3-0-0). Selected topics in manpower management and forensic medicine.
H S A 511. *Special Seminar in Health Service Administration.* ★3 (0-3s-0). Selected topics in non-parametric statistics as applied to research in health services administration.
H S A 513. *Nursing Service Administration.* ★3 (Second Term, 3-0-0).
H S A 520. *Principles of Health Service Administration.* ★3 (3-0-0). A review of social science theory, method, and research findings as they relate to the administration and management of health and welfare service agencies.
H S A 521. *Advanced Health Service Administration.* ★3 (3-0-0). Study of the application of principles and procedures reviewed in H S A 520 to problems of health service management.
H S A 530. *Statistics for Health Services Administration.* ★3 (First Term, 3-0-0).
H S A 531. *Research Methods in Health Services Administration.* ★3 (Second Term, 3-0-0).
H S A 535. *Problems and Issues in Epidemiology.* ★3 (Second Term, 3-0-0).
H S A 550. *Health Services Finance.* ★3 (First Term, 3-0-0).
H S A 551. *Problems and Issues in Health Services Finance.* ★3 (Second Term, 3-0-0).
H S A 560. *Planning and Operations Analysis in Health Services Administration.* ★3 (First Term, 3-0-0).
H S A 561. *Systems Analysis in Health Care Delivery.* ★3 (Second Term, 3-0-0).
H S A 570. *Health Care Economics.* ★3 (First Term, 3-0-0).
H S A 571. *Problems and Issues in Health Care Economics.* ★3 (Second Term, 3-0-0).
H S A 600. *Advanced Seminar in Health and Welfare Services Administration.* ★3 (First Term, 0-3s-0).
H S A 601. *Advanced Seminar in Health and Welfare Services Delivery.* ★3 (Second Term, 0-3s-0).
H S A 610. *Conference Course.* ★3 (either term, 0-3s-0).
HSA 630. *Quantitative Techniques in Health Services Planning and Evaluation: I.* ★3 (either term, 3-0-0).
HSA 631. *Quantitative Techniques in Health Services Planning and Evaluation: II.* ★3 (either term, 3-0-0).
HSA 900. *Non-Thesis Project.* ★3 (Hours to be arranged to the equivalent of 3-0-0).

NOTE: Further information may be obtained from the Director, Division of Health Services Administration, Faculty of Medicine.

204.40 History

204.40.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of History offers instruction leading to the degrees of Master of Arts and Doctor of Philosophy.

(2) M.A. programs are offered in several fields of Asian, British, Canadian, European, Latin American and United States history. Ph.D. programs are offered in certain areas of these fields in which adequate library resources and supervision are available.

(3) A student holding a four-year Honors or Special B.A. in History from The University of Alberta, or a comparable degree from another university, may be admitted to the status of Candidate for the M.A. degree. A student who lacks the above qualification but who holds an acceptable bachelor's degree, or its equiva-

lent, may be admitted as a Qualifying Graduate Student, who will be expected to complete additional courses before proceeding to the M.A. program proper.

(4) A student proposing to enter a Ph.D. program is expected to hold an acceptable M.A. degree or its equivalent. In exceptional cases, a student admitted as a candidate for the M.A. may subsequently be permitted to enter the Ph.D. program without writing a Master's thesis.

(5) All Candidates for the M.A. and all Provisional Candidates for the Ph.D. must demonstrate competence in reading a language other than English by passing an examination administered by the Department. For all graduate students specializing in Canadian history the language must be French; the specific language requirement for others will be decided in consultation with the student's supervisor. In addition, the Department expects every candidate for an advanced degree to be proficient in any language or languages necessary for carrying out his/her thesis research.

(6) A student admitted as a Qualifying Graduate Student must normally take five full courses or the equivalent, at least three being History courses, and attain a grade-point average of 7.0, with no single grade below 6. The courses will usually be senior undergraduate courses at the 300 or 400-level; they will be chosen in consultation with the Chairman of the Department's Graduate Studies Committee. Advancement to candidacy status may be delayed until the student has passed the language examination.

(7) A student admitted as a Candidate for the M.A. must:

(i) write a thesis, the text of which should normally be not less than 100 nor more than 150 pages in length;
(ii) take and pass one 500-level bibliographical seminar (History 521-590 below);
(iii) take and pass History 602 (Philosophy of History and Historical Methodology), if the student does not already hold credit in an equivalent course acceptable to the Department; and
(iv) pass a language examination administered by the Department, if the student has not previously done so.

(8) All students proposing to proceed to the Ph.D. are admitted initially as Provisional Candidates. A Provisional Candidate must:

(i) take and pass two 500-level bibliographical seminars in History (though this requirement may be waived in whole or in part if these or similar seminars have been taken previously);
(ii) take and pass two 600-level seminars in History;
(iii) take and pass History 602 if the student does not already hold credit in this or in an equivalent coarse;
(iv) pass a language examination administered by the Department, if the student has not previously done so; in addition, the student may be required to pass a second language examination, but the Department never requires any student to pass examinations in more than two languages other than English; and
(v) submit a thesis proposal based on some preliminary research.

(9) When a Provisional Candidate has completed the requirements outlined in (8) above, normally not later than eighteen months after entering the program, he/she will be expected to pass written comprehensive examinations in two fields as defined in History 521-590. The comprehensive examination in each field will consist of two three-hour parts, which must be written on consecutive days. One part will test the student's knowledge of the general field; the other will test the student's depth of knowledge in a special area of that field defined in advance in consultation with the student's supervisory committee. These examinations are administered during two periods each year, in September or October and in March or April.

(10) If the Provisional Ph.D. Candidate passes written comprehensive examinations in both fields, he/she will be permitted to proceed to the oral candidacy examination. The two written examinations and the oral examination must all be attempted within the space of one month. Upon successful completion of the oral examination, the student will be advanced to formal candidacy for the Ph.D.

(11) A student who has been admitted to candidacy for the Ph.D. may proceed to the degree by completing a thesis, the text of which should normally be not less than 250 nor more than 400 pages in length.

(12) The Department annually appoints a number of Graduate Research and Teaching Assistants. History graduate students are also eligible for various University fellowships and bursaries. For details, see the Awards section of this calendar.

(13) Application forms, information about fellowships, bursaries, etc., and a departmental bulletin on *Higher Degrees in History* may be obtained from the Dean of the Faculty of Graduate Studies and Research. Requests for other information should be directed to the Chairman, Graduate Studies Committee, Department of History.

204.40.2 GRADUATE COURSES

THES 000. *Thesis.*

Previous study in the area is prerequisite for each course.

HIST 521. *Medieval Europe.* ★6 (0-3s-0).
HIST 523. *Early Modern Western Europe.* ★6 (0-3s-0).
HIST 525. *Modern Western Europe.* ★6 (0-3s-0).
HIST 527. *Russia and Eastern Europe.* ★6 (0-3s-0).
HIST 531. *Modern European Intellectual History.* ★6 (0-3s-0).
HIST 552. *Medieval England.* ★6 (0-3s-0).
HIST 554. *Early Modern England.* ★6 (0-3s-0).
HIST 556. *Modern England.* ★6 (0-3s-0).
HIST 558. *British Empire and Commonwealth.* ★6 (0-3s-0).
HIST 560. *United States.* ★6 (0-3s-0).
HIST 570. *Canada.* ★6 (0-3s-0).
HIST 580. *East Asia.* ★6 (0-3s-0).
HIST 582. *China.* ★6 (0-3s-0).
HIST 583. *Japan and Korea.* ★6 (0-3s-0).
HIST 584. *Southeast Asia.* ★6 (0-3s-0).
HIST 590. *Latin America.* ★6 (0-3s-0).
HIST 600. *Conference Course* ★6 (0-3s-0). Directed study to meet individual requirements.
HIST 601. *Documentary Chinese for Historians.* ★6 (0-3s-0). Prerequisite: previous training in the Chinese language and consent of the Department.
HIST 602. *Philosophy of History and Historical Methodology.* ★6 (0-3s-0). Note: Required of all candidates for higher degrees in History.
HIST 603. *Documentary Japanese for Historians.* ★6 (0-3s-0). Prerequisite: Previous training in the Japanese language and consent of the Department.
HIST 604. *Historical Interpretations.* ★6 (0-3s-0).
HIST 605. *Research Seminar.* ★3 (either term, 0-3s-0). Specific area of research is announced by the Department in the term before the seminar is offered.
HIST 607. *Methods of Quantification for Historians.* ★3 (either term, 0-3s-0).
HIST 608. *Studies in Comparative History.* ★6 (0-3s-0). Studies in select topics in comparative historical institutions and ideas. Topics to be announced annually.

HIST 611. *Topics in European Diplomatic History, 1870-1945.* ★6 (0-3s-0).
HIST 612. *Topics in Modern German History.* ★6 (0-3s-0).
HIST 621. *Medieval Europe.* ★6 (0-3s-0).
HIST 623. *Early Modern Western Europe.* ★6 (0-3s-0).
HIST 625. *Modern Western Europe.* ★6 (0-3s-0).
HIST 627. *Russia and Eastern Europe.* ★6 (0-3s-0).
HIST 631. *Modern European Intellectual History.* ★6 (0-3s-0).
HIST 632. *Revolutionary Movements in France, 1789-1914.* ★6 (0-3s-0).
HIST 652. *Medieval England.* ★6 (0-3s-0).
HIST 654. *Early Modern England.* ★6 (0-3s-0).
HIST 656. *Modern England.* ★6 (0-3s-0).
HIST 658. *The British Empire.* ★6 (0-3s-0).
HIST 660. *The United States.* ★6 (0-3s-0).
HIST 670. *Canada.* ★6 (0-3s-0).
HIST 672. *Seminar in the History of the Canadian West.* ★6 (0-3s-0).
HIST 680. *East Asia.* ★6 (0-3s-0).
HIST 682. *China.* ★6 (0-3s-0).
HIST 683. *Japan and Korea.* ★6 (0-3s-0).
HIST 684. *Southeast Asia.* ★6 (0-3s-0).
HIST 690. *Latin America.* ★6 (0-3s-0).

204.41 Home Economics

204.41.1 THE DEGREE OF M.SC.

(1) Graduate study leading to the degree of Master of Science may be undertaken in the Faculty of Home Economics. The major work may be undertaken in (1) Clothing and Textiles, (2) Family Life Education, (3) Family Studies, (4) Foods, (5) Nutrition, (6) Consumer Studies.

(2) Candidates should hold a Bachelor's degree. A candidate proceeding from either a three-year program in a related field or from a three- or four-year program in a completely different field may be admitted as a qualifying student. One must also meet the requirements of the Faculty of Graduate Studies and Research.

(3) Programs of study include course work and thesis. Course requirements depend upon the area of specialization and the undergraduate background of the student.

(4) A number of teaching and research assistantships are available for well qualified applicants.

(5) Inquiries should be addressed to the Dean of the Faculty.

204.41.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

Clothing and Textiles

CL TX 400. *Design in Everyday Living.* ★3 (either term, 3-0-3). Introduction to design at the senior level; development of visual awareness and aesthetic appreciation. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 200.

CL TX 406. *Clothing Construction.* ★3 (Second Term, 3-0-3). Application of basic principles of clothing construction and fitting to garments made of fabrics requring special techniques. Prerequisite: Gradaute standing. May not be taken for credit by students with credit in CL TX 203 and CL TX 307.

CL TX 408. *Clothing and the Consumer.* ★3 (First Term, 3-0-0). Senior level application of behavioral sciences concepts to clothing. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 300.

CL TX 409. *Textile Science.* ★3 (Second Term, 3-0-3). An introduction to textile concepts and principles. Prerequisite: Graduate standing. Note: May not be taken for credit by students with credit in CL TX 309 and CL TX 310.

CL TX 411. *Advanced Textiles.* ★3 (Second Term, 3-0-3). Introduction to yarn and fabric geometry. Advanced study of polymer formation, specialized polymers and textile finishes. Theory of color, study of major classes of dyes. Degradation of textiles. Prerequisites: CHEM 200 and CL TX 310.

CL TX 412. *Socio-Cultural Bases of Clothing.* ★3 (First Term, 3-0-0). Similarities and differences in functions of clothing in various cultures. Selection of clothing as an expression of collective behavior. Prerequisites: PSYCO 260 or SOC 202; or ANTHR 202 or 307, and CL TX 300; or consent of the instructor.

CL TX 416. *Economics of Clothing and Textiles.* ★3 (First Term, 3-0-0). The structure and economic importance of the textile and apparel industries; consumption of textiles and apparel; the impact of legislation and government policy on the textile and apparel market place. Prerequisites: ECON 201/202 or 306/307.

CL TX 417. *Selected Topics.* ★3 (either term, 3-0-0 or 3-0-3 or 2-0-4). Topics of current interest in clothing, textiles and design. Prerequisite: Varies with specific offering.

CL TX 419. *Preventive Textile Conservation.* ★3 (First Term, 3-0-3). Theoretical and practical investigation of the preventive care of textiles and costumes in museums or related institutions. Topics include an overview of deteriorating factors, as well as procedures for handling, storage, display and preventive treatment. Museums collections and personnel will augment university lecture, seminar, laboratory and study collection facilities. Prerequisites: CL TX 304, 309, 403 and 404 or consent of instructor.

Family Studies

FAM 440. *Consumer Problems.* ★3 (First Term, 3-0-0). An analysis of problems faced by the family as consumer within the framework of the economic, sociological, psychological and legal factors which create these problems. Sources of information and aid for the consumer. Prerequisite: ECON 201/202 or 306/307 or completion of an approved economics module available from the division.

FAM 442. *Family and the Mentally Retarded Child.* ★3 (First Term, 3-0-0). An in-depth study of the impact of mentally retarded children on their families. Adjustment of these families and other related institutions to mentally retarded children is discussed. Socio-psychological literature is reviewed to explore theoretical and practical issues involved in the interaction between the family and the mentally retarded child. Note: To be offered as staffing will allow.

FAM 447. *The Family in Contemporary Society.* ★3 (Second Term, 3-0-0). An interdisciplinary study of the family in modern western society. The nature of the relationship between the family system and selected systems in the society will be considered. Prerequisite: FAM 241 or 350, or SOC 371 or consent of the instructor.

FAM 448. *Understanding Family Communication.* ★3 (either term, 3-0-0). The synthesis of knowledge of communication with knowledge of family relationships and the application of that combination to the student's experience. Emphasis is placed on the effect of communication on individual behaviour and family patterns.

FAM 449. *Family Study: Selected Topics.* ★3 (either term, 3-0-0). Students may enroll in this course more than once provided each time it is taken the topic is different. (To be offered in alternate years to FAM 442).

FAM 450. *Family Finance.* ★3 (First Term, 2-1s-1.5). Principles of money management applied to family income and expenditure. Budgeting and management of savings will be important. Special emphasis will be placed on the management of credit, investment, insurance, housing. The particular needs of low income money management will be stressed. Prerequisites: FAM 340, 440 and ECON 201, 202 or 306, 307 or consent of the instructor. This course will not be offered each year.

FAM 460. *Family and Consumer Law.* ★3 (3-0-0). An exploration of family and consumer law from a use's perspective. (To be taught in cooperation with the Faculty of Law). This course will be offered during Special Sessions only.

Foods and Nutrition

FD NU 427. *Consumer Acceptance of Foods.* ★3 (First Term, 3-0-3). Factors influencing consumer acceptance of food with special reference to food safety, quality control, toxicological implications of intentional and incidental food additives and implications of product development for the con-

sumer. Prerequisites: FD NU 320 and 321 or consent of the instructor.

FD NU 429. *Experimental Foods.* ★3 (First Term, 3-0-3). Application of the experimental method to food problems. Sensory and objective evaluation of food properties. Development of an individual research problem. Prerequisites: FD NU 320 and 321 or consent of the instructor.

FD NU 464. *Nutrition.* ★3 (First Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on energy, carbohydrates, fats and proteins. Prerequisite: BIOCH 300.

FD NU 465. *Nutrition.* ★3 (Second Term, 3-0-3). The principles of nutrition applied to feeding of individuals of various ages under normal conditions with emphasis on vitamins and minerals. Prerequisite: BIOCH 300.

204.41.3 GRADUATE COURSES

THES 000. *Thesis.*

Clothing and Textiles

CL TX 502. *Independent Study I.* ★3 (either term, 0-0-6). Independent study planned by student in consultation with faculty from one of the following areas or suitable combination of areas: Textile Science; Housing; Interiors or Furniture Design; Textile or Dress Design; History of Costume, Textile or Furniture, Textile Conservation and Clothing for Special Needs. Prerequisite: Senior course(s) in respective area(s) and consent of instructor.

CL TX 503. *Independent Study II.* ★3 (either term, 0-0-6). Independent study planned by student in consultation with faculty from one of the following areas or suitable combination of areas: Textile Science; Housing; Interiors or Furniture Design; Textile or Dress Design; History of Costume, Textile or Furniture, Textile Conservation and Clothing for Special Needs. Prerequisite: Senior course(s) in respective area or consent of the instructor.

CL TX 506. *Practicum in Selected Areas.* ★3 (either term, 0-1s-8). Supervised field experience. Prerequisite: Senior course in respective area and consent of the instructor.

CL TX 507. *Historic Resources Internship.* ★3 or ★6. Internship with an institution involved in historic resources conservation. Normally offered in Special Sessions by special arrangement. Prerequisites: CL TX 304, 403, 404, 504 and consent of the Division.

CL TX 510. *Current Issues in Clothing and Textiles I.* ★1 (either term, 0-1s-0). Prerequisites: varies with offering. (Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.)

CL TX 511. *Current Issues in Clothing and Textiles II.* ★1 (either term, 0-1s-0). Prerequisite: varies with offering. (Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.)

CL TX 512. *Current Issues in Clothing and Textiles III.* ★1 (either term, 0-1s-0). Prerequisite: varies with offering. (Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.)

CL TX 514. *Personality and Clothing.* ★3 (Second Term, 3-0-0). A review of literature and research dealing with psychological processes and the application of personality and motivation theories to specific behaviors related to clothing. Prerequisites: PSYCO 383; CL TX 412 or consent of the instructor.

CL TX 517. *Clothing: Selected Topics.* ★3 (either term, 3-0-0 or 3-0-3 or 2-0-4). Topics of current interest in clothing, textiles, and design. Prerequisite: Senior course(s) in respective area(s).

CL TX 518. *Textile Seminar.* ★3 (Second Term, 0-3s-0). Familiarization with current literature and developments in textiles with an emphasis on consumer-oriented textiles research. Prerequisite: CL TX 410 or 411.

CL TX 519. *Textile Conservation Theory and Practice.* ★3 (Second Term, 3-0-3). Theoretical and practical investigation of the degradation and treatment of historic textiles and costumes. Lecture and laboratory experiences will include an in-depth study of factors affecting the degradation of fibers, as well as methods of cleaning, bleaching and consolidation. Prerequisites: CL TX 310 and 419.

CL TX 520. *Literature Review.* ★3 (First Term, 3-0-0). A survey of the clothing and textiles research literature obtained from the application of information retrieval techniques to the numerous secondary services which cover the literature.

CL TX 600. *Clothing and Textiles Seminar.* ★1 (either term, 0-1s-0). The development of a research proposal. Prerequisite: A course in research methods.

Family Studies

CL TX 620. *Research Methods in Clothing and Textiles.* ★3 (Second Term, 3-0-0). A study of various types of research in clothing and textiles and the development of a research proposal with specific attention to: objectives of study, theoretical framework, hypotheses, sampling, data collection, analyses and interpretation of findings. Prerequisite: A half course in Statistics and CL TX 520 or consent of the instructor.

FAM 500. *Introduction to Family Studies.* ★3 (First Term, 3-0-0). A review of the basic content and philosophy of the study of the family from the particular emphasis of the Family Studies Division. Open only to family studies graduate students or students with the consent of the Division.

FAM 540. *Seminar: Consumer Studies.* ★3 (either term, 0-3s-0). Examination of the research and theory related to consumer behavior, the application of these to consumer problems and the implications for consumer education.

FAM 541. *Seminar: Human Sexuality and Sex Education in Family Life Education.* ★3 (either term, 0-3s-0). Emphasis on socio-psycho-cultural factors in development of human sexuality, with consideration given to research findings and their practical application, i.e., sex education. By permission of instructor only.

FAM 543. *Seminar: Family Life Education in Home, School and Community.* ★3 (either term, 0-3s-0). Examination and analysis of the basic issues facing family life education and education in the various settings of home, school and community. By permission of instructor only.

FAM 547. *Family Intervention Program Development and Evaluation.* ★3 (either term, 0-3s-0). This course is designed for graduate students whose professional goals are in the area of family life education. It will focus on the design, implementation and evaluation of educational intervention programs such as marriage enrichment, family enrichment, parent education. Emphasis will be educational, rather than remedial. Prerequisite: FAM 543 or consent of instructor. (A practicum experience may be arranged to be taken in conjunction with this course under FAM 649). To be offered as staff permit.

FAM 551. *The Family in Crisis.* ★3 (Second Term, 0-3s-0). An analysis of the processes involved in family crisis. Family disorganization, reorganization, and change associated with such crises as alcoholism, aging, birth, and death are considered. Prerequisite: FAM 241 or 350 or SOC 371, or consent of the instructor.

FAM 553. *Applied Theory and Research in Marriage and Family.* ★3 (First Term, 3-0-0). The consideration of research and theory in marriage and the family as it relates to the development of family practice in family life education and other related and practical aspects of Family Studies. Prerequisite or corequisite: SOC 311 and a minimum of three half courses in Family Studies selected from Home Economics, Sociology, Educational Psychology, Psychology or Anthropology.

FAM 559. *Independent Study I.* ★3 (either term, 0-0-6). Independent study of topics in family studies including independent laboratory and library research. Prerequisite: Students must receive consent from instructor prior to registration.

FAM 560. *Independent Study II.* ★3 (either term, 0-0-6).

FAM 600. *Seminar: Family Studies Research* ★3 (Second Term, 0-3s-0). Required of all Family Studies Graduate students to discuss family research methodology related to their thesis. Prerequisite: FAM 553 and a graduate level statistics course.

FAM 645. *Seminar in Applied Theory in Marriage and Family Counselling.* ★3 (either term, 0-3s-0). Certain selected theories in Marriage and Family Counselling are examined in terms of both their underlying assumptions and their general applicability in promoting effective counselling outcomes. By permission of instructor only.

FAM 649. *Seminar in Family Study: Selected Topics.* ★3 (either term, 0-3s-0). This course will be offered as staff and time permit. By permission of instructor only.

FAM 659. *Graduate Practicum in Family Studies.* ★3 (either term, 0-0-6). Selected practicum placements to integrate theory and practice in a variety of family agencies. Prerequisite: Consent of supervisor and division.

FAM 660. *Independent Study IV.* ★3 (either term, 0-0-6).

Foods and Nutrition

FD NU 504. *Experimental Techniques.* ★3 (either term, 0-0-6). Application of chemical methods and bioassays to research in nutrition. Prerequisite: CHEM 312.

FD NU 506. *Advanced Clinical Dietetics.* ★3 (First Term, 3-0-3). Principles of diet therapy in selected areas of current interest. Emphasis on case studies, research and practical problems in diet therapy. Prerequisite: FD NU 406.

FD NU 507. *Nutrition in the Community.* ★3 (Second Term, 3-0-3). Examination of nutrition problems in contemporary communities. The application of basic concepts of foods and nutrition to community nutrition problems. Discussion of nutrition programs and resources. Prerequisites: FD NU 464 and 465 or FD NU 325 and 327.

FD NU 508. *Advanced Nutrition.* ★3 (First Term, 3-0-0). A lecture and reading course. Prerequisites: FD NU 464 anJ 465 or consent of the instructor.

FD NU 509. *Advanced Nutrition.* ★3 (Second Term, 3-0-0). A lecture and reading course. Prerequisites: FD NU 464 and 465 or consent of the instructor.

FD NU 510. *Food Safety and Hygiene.* ★3 (Second Term, 3-0-0). The rationale of Public Health, Consumer and Corporate Affairs and Food and Drug regulations related to Foods and Nutrition, with special emphasis on institutional management. Care and handling of foods in the retail store, institution and the home. Prerequisite: FD SC 465 or consent of the instructor.

FD NU 511. *Advanced Foods.* ★3 (Second Term, 3-0-0). Quality characteristics of foods. Current scientific information about foods used in the home and in institutions with emphasis on quality factors such as color, texture and flavor. Prerequisites: FD NU 320 and 321, and BIOCH 300, or consent of the instructor.

FD NU 600. *Food and Nutrition Seminar.* ★0 (either term, 0-1s-0). Required both terms of all graduate students.

FD NU 602. *Research Project in Nutrition or Foods.* ★3 (either term, 0-0-6).

FD NU 603. *Further Research Project in Nutrition or Foods.* ★3 (either term, 0-0-6).

204.42 Immunology

204.42.1 UNDERGRADUATE COURSES

Instruction in Immunology is included in Medicine 421. The Department of Immunology also offers elective undergraduate courses.

IMMUN 447. ★0 (4 weeks). Supervised laboratory and reading programs in immunology. Available for students in Phase III only.

Interested students should consult the calendar entries for the Departments of Medicine and Pathology in this calendar, and for the Departments of Genetics (§ 184.11), Microbiology (§ 184.22), and Zoology (§ 184.32) in the Faculty of Arts and Science Calendar.

204.42.2 GRADUATE COURSES

THES 000. *Thesis.*

IMMUN 500. *Current Topics in Immunology.* ★3 (Second Term, 3-0-0). Lecture and discussion sessions based on original factual and theoretical papers. Topics include the origin of antibody diversity, humoral and cell-mediated immunity, cellular collaboration, positive and negative regulatory mechanisms in immunity, self tolerance, unresponsive states, autoimmunity, transplantation, and immunogenetics. Students will be expected to prepare seminars on assigned topics. Prerequisite: Consent of the Department. Offered alternate years.

204.43 Industrial and Vocational Education

204.43.1 THE DEGREE OF M.ED.

(1) The Department of Industrial and Vocational Education offers programs leading to the Master of Education degree in Industrial Arts and in Vocational Education.

(2) Graduate programs in Industrial Arts and in Vocational Education normally include both professional courses in education and senior or graduate courses offered by other faculties in the University.

(3) Before a student can be admitted as a candidate for the M.Ed. degree, his/her record must be acceptable to the Faculty of Graduate Studies and Research and to the Department.

(4) A number of assistantships are available to well-qualified candidates for the M.Ed. degree.

(5) The prospective candidate should consult the Chairman of the Department of Industrial and Vocational Education who, together with other members of the staff, will plan an appropriate program.

204.43.2 GRADUATE COURSES

THES 000. *Thesis.*

EDIND 500. *Industrial and Vocational Education Seminar.* ★0 Non-credit. Hours to be arranged. Reports and discussion by staff and graduate students to provide candidates for advanced degrees with experience in the selection and evaluation of research problems and procedures.

EDIND 509. *Development and Principles of Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 511. *Curriculum and Instruction in Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 519. *Supervision and Planning of Industrial and Vocational Facilities and Programs.* ★3 (either term, 3-0-0).

EDIND 521. *Evaluation of Industrial and Vocational Education Programs.* ★3 (either term, 3-0-0).

EDIND 539. *Technological Assessment and its Implication for Industrial and Vocational Education Curricula.* ★3 (either term, 3-0-0).

EDIND 541. *Technological Forecasting and Its Implication for Industrial and Vocational Education Curricula.* ★3 (either term, 3-0-0).

EDIND 549. *Survey of Occupations — Conference Seminar I.* ★3 (either term, 1-0-3).

EDIND 551. *Survey of Occupations — Conference Seminar II.* ★3 (either term, 1-0-3).

EDIND 585. *Individual Directed Laboratory Study.* ★3 (either term, 3-0-3).

EDIND 587. *Individual Directed Study.* ★3 (either term, 3-0-0) Prerequisite: Consent of the Department.

EDIND 589. *Organization of Industrial and Vocational Education* ★3 (either term, 3-0-0).

EDIND 591. *Problems and Trends in Industrial and Vocational Education.* ★3 (either term, 3-0-0).

EDIND 593. *Survey of Industrial and Vocational Education Research I.* ★3 (either term, 3-0-0).

EDIND 595. *Survey of Industrial and Vocational Education Research II.* ★3 (either term, 3-0-0).

EDIND 900. *Non-Thesis Project.* ★6 (variable).

"400" Level Courses

The Department of Industrial and Vocational Education is prepared to accept any two full course equivalents (four one-half courses) of the following to apply as graduate courses on a Master of Education Degree program:

EDIND 412	EDIND 490
EDIND 416	EDIND 492
EDIND 434	EDIND 494
EDIND 436	EDIND 496
EDIND 438	EDIND 497
EDIND 457	EDIND 498
EDIND 465	EDADU 460
EDIND 477	EDADU 461

Departmental approval will be necessary to take any of these "400" level courses.

204.44 Interdisciplinary Courses

Courses listed below are the joint concern of the departments stated. Instruction will be offered by members of one or more of the departments or faculties listed. Responsibility for registration is with the department indicated. For additional information please consult this department or other participating departments.

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0). (Offered jointly by Departments of Rural Economy and Sociology. Students register in the Department of Rural Economy.)

INT D 458. *Agrarian Social Movements.* ★3 (either term, 3-0-0). (Offered jointly by Departments of Rural Economy and Sociology. Students register in the Department of Rural Economy.)

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0). (Division of Community Development and Department of Sociology. Students register in the Department of Sociology.)

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0). (Students register in the Department of Rural Economy.)

INT D 468. *Principles of International Humanitarin Law.* ★3 (either term, 3-0-0). Note: Formerly IN ST 466. [Political Science].

INT D 486. *Livestock and Meat Marketing.* ★3 (Second Term, 3-0-0). (Offered jointly by the Department of Animal Science and Rural Economy. Students register in the Department of Rural Economy.)

INT D 500. *Nature of Man.* ★6 (0-3s-0). (Offered jointly by Departments of Philosophy and Psychology. Students register in the Department of Philosophy.)

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). (Students register in the Department of Microbiology.)

INT D 506. *Community Development Field Methods and Techniques.* ★3 (either term, 3-0-2). (Students register in the Division of Community Development.)

INT D 509. *Conference Course in Community Development.* ★3 (either term, 3-0-0). (Students register in the Division of Community Development.)

INT D 510. *Community Development Practicum.* ★3 (either term, 3-0-0). (Students register in the Division of Community Development.)

INT D 516. *Learning in the Community.* ★3 (Second Term, 3-0-2). (Students register in the Division of Community Development.)

INT D 540. *Seminar on Comparative, Legal, Constitutional and Federal Studies.* ★6 (0-3s-0). (Offered jointly by the Departments of History and Political Science. Students register in the Department of Political Science.)

INT D 546. *East European and Soviet Studies.* ★6 (3-0-0). (Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, and Sociology. For information contact the Division of East European Studies.)

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). (Offered jointly by the Departments of Botany and Plant Science. Students register in the Department of Plant Science.)

INT D 559. *Theories of Community Development.* ★3 (either term, 3-0-0). (Students register in the Division of Community Development.)

INT D 565. *Northern Studies.* ★3 (Second Term, 3-0-0). (Offered by the Boreal Institute for Northern Studies and the Department of Geography. Students register in the Department of Geography.)

INT D 566. *Resource Economics II: Economics of the Environment.* ★3 (either term, 3-0-0). (Students register in the Department of Economics.)

INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0). (Offered jointly by the Departments of Philosophy and Psychology. Students register in the Department of Psychology.)

INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0). (Offered jointly by the Departments of Philosophy and Psychology. Students register in the Department of Psychology.)

INT D 601. *Comparative Community Development.* ★3 (First Term, 3-0-0). (Students register in the Division of Community Development.)

INT D 602. *Current Issues in Community Development.* ★3 (Second Term, 3-0-0). (Students register in the Division of Community Development.)

INT D 623. *Clinical Research Seminar on Aphasia.* ★3 (either term, 3-0-3). Students register in the Department of Linguistics.

INT D 653. *Regionalism and Urban Planning.* ★3 (either term, 3-0-0). (Departments of Geography and Sociology. Students register in the Department of Geography.)

INT D 900. *Non-Thesis Project.* ★3 (variable) M.A. non-thesis route. (Students register in the Division of Community Development.)

204.45 Law

204.45.1 THE DEGREE OF LL.M.

(1) The Faculty of Law offers a program of graduate study leading to the degree of Master of Laws.

(2) Applicants for this program must hold the degree of LL.B. or its equivalent from this or some other university, of sufficient standard to satisfy the Dean of the Faculty that they will be capable of undertaking and profiting by the program. They must also meet the general requirements for admission to the Faculty of Graduate Studies and Research.

(3) All candidates for the degree of Master of Laws must complete at least one academic year, i.e., normally one academic session from September to May, in residence at the University. In special circumstances the Dean of the Faculty may prescribe some longer period, or may permit the required period of residence to be spread over two consecutive academic sessions.

(4) To obtain the degree of Master of Laws candidates must submit and defend a thesis on a topic selected by themselves, subject to the approval of the Dean, in addition to attending courses throughout two terms, the number and character of such courses to be determined in consultation with the Dean.

(5) A candidate may select courses from a broad spectrum of legal subjects offered in the Faculty of Law as well as relevant subjects in other Faculties.

(6) Financial assistance, including Intersession Term Graduate Fellowships, may be available to suitably qualified candidates. Such assistance will involve candidates in the performance of certain teaching or research duties in the Faculty of Law, though such duties will not impede candidates in the pursuit of their own studies. In addition, The University of Alberta offers certain scholarships to candidates of sufficiently high academic merit.

(7) Inquiries regarding programs, courses and financial assistance other than University scholarships should be made to the Dean of the Faculty of Law. Inquiries about University scholarships should be made to the Dean of the Faculty of Graduate Studies and Research.

204.45.2 GRADUATE COURSES

Graduate courses include those offered in the Faculty of Law and related disciplines which have been selected by a candidate in consultation with the supervisor and which have the consent of the Dean.

POSTGRADUATE DIPLOMA PROGRAM

(1) The Faculty of Law also offers a Postgraduate Diploma Program in Law for the fall and winter terms which may be of interest to members of Canadian law societies and other legally qualified persons.

(2) The program was designed to provide an extensive exposure to a limited area of the law and help prepare candidates as specialists in that area.

(3) The program will also provide candidates with the opportunity to become familiar with the most modern developments and to bring practitioners and other members of the legal profession up to date.

Admission Requirements

(4) Applicants for the Diploma Program must hold the degree of LL.B., or its equivalent, from an approved university and must have had a minimum of two years experience in the practice of law or in a related field.

(5) Acceptance in a Postgraduate Diploma program will be determined by the Faculty of Graduate Studies in consultation with the Committee of Postgraduate Diploma Studies of the Faculty of Law.

(6) The Diploma Program consists of the satisfactory completion of a minimum of three courses. Normally these will be single term courses offered by the Faculty of Law. These courses will be selected by consultation between the candidate and the chairman of Postgraduate Diploma Studies of the Faculty of Law. The courses selected will be from the courses regularly offered by the Faculty of Law and will normally reflect a concentration in one particular area of the law.

(7) Candidates for the Postgraduate Diploma will not normally be permitted to take courses they completed for the degree of LL.B. This will apply to graduates of other universities as well as to graduates of the University of Alberta.

(8) With the permission of the Chairman and Committee on the Postgraduate Diploma Program, however, a candidate may take certain courses (e.g. Taxation, Land Use Planning) whose content has changed significantly since the candidate took the LL.B.

(9) Upon successful completion of the program the candidate will be granted the degree of Postgraduate Diploma in Law.

(10) The following are the subject areas in which a Diploma in Law may be earned:

(a) Postgraduate Diploma in Criminal Law
(b) Postgraduate Diploma in Land Use Planning
(c) Postgraduate Diploma in the Law of Oil and Gas
(d) Postgraduate Diploma in International Law
(e) Postgraduate Diploma in Public Law
(f) Postgraduate Diploma in The Law of Taxation
(g) Postgraduate Diploma in Antitrust and Combines Law
(h) Postgraduate Diploma in Labour Law
(i) Postgraduate Diploma in Commercial Law
(j) Postgraduate Diploma in Divorce and Matrimonial Causes
(k) Postgraduate Diploma in Constitutional Law
(l) Postgraduate Diploma in the Law of Torts

(11) Inquiries regarding programs, courses and admissions should be made to the Faculty of Graduate Studies and Research.

204.46 Library Science

204.46.1 HISTORICAL NOTE

The Faculty of Library Science, the only professional library school in the prairie provinces offers the Master of Library Science Degree.

The first classes in a Bachelor of Library Science program began in 1968. In 1970 the B.L.S. program was accredited by the Committee on Accreditation of the American Library Association and was thus recognized by the American and Canadian Library Associations as meeting library education standards.

In 1971 the Faculty initiated a Master of Library Science program for which the B.L.S. program was the qualifying year. In 1976, in keeping with the Canadian pattern of North American education for librarianship, the B.L.S. was discontinued, and the present two-year M.L.S. program was instituted.

As the first professional degree, the M.L.S. represents a program designed to develop the knowledge, understanding, attitudes, and skills that will prepare graduates for positions of responsibility in school, public, academic, and special libraries. The M.L.S. program was accredited by the American Library Association in January, 1979.

204.46.2 GOALS AND OBJECTIVES

The general goal of the Faculty is to provide learning experiences that will assist its graduates to assume responsibility and leadership in meeting the information needs of a changing society. The Faculty acknowledges its responsibility to provide such experiences based upon a continuous exploration or library functions and services, and its responsibility to undertake the necessary planning and research. These responsibilities include provision for the continuing education needs of practising librarians.

The specific objectives of the M.L.S. degree program are: a) To provide a theoretical and methodological base which will enable students to analyze problems, design solutions, and adapt library principles to changing social conditions; b) To prepare studends to select, organize, and disseminate information, and to develop and administer programs of service in the light of changing public needs and demands; c) To prepare students for professional positions in librarianship and cognate fields.

204.46.3 STUDENT ORGANIZATIONS

There is an organization for all students enrolled in the Faculty of Library Science. Students elect their own officers, with the presiding officer representing them at meetings of the Faculty Council. The organization provides liaison between students and facutly and encourages participation in a variety of academic, professional and extracurricular activities.

In addition to the regular student organization, there is an official University of Alberta Student Chapter of the American Society for Information Science (ASIS), which was founded by students in the Faculty of Library Science. The Chapter, which was chartered by ASIS Council in May, 1977, serves interested students in the Greater Edmonton area and provides special programs relating to modern methods of information processing such as computer-based procedures and reprographic techniques.

204.46.4 LABORATORY-LIBRARY

The Faculty of Library Science maintains a laboratory-library which provides, in addition to library space, facilities for group and individual work and study. The collection, designed to supplement that of the University Libraries, includes some 10,000 volumes and a full range of audio-visual materials. The collection is composed of standard library and information science texts, sample reference and selection tools, periodicals, annual reports, and materials for children and young people.

Faculty Computing Facilities

The Faculty of Library Science has three terminals, two print terminals (one stationary, the other portable) and a CRT terminal. All operate at 30 characters per second through acoustic couplers and standard voice-grade telephone lines. They are available to faculty members and students for instruction, research, and demonstrations, both with the University's computing facilities and also with external data bases. Access is routinely provided to such external services as those of Lockheed, Informat (SDC), OCLC, CAN-OLE, and others.

204.46.5 ADMISSION REQUIREMENTS FOR M.L.S. PROGRAM

(1) The applicant must have a Bachelor's degree from a recognized institution of higher learning, with academic standing acceptable to the Faculty of Graduate Studies and Research and the Faculty of Library Science. In some instances the University is prepared to admit students who have achieved high scores on the Graduate Record Examination Aptitude Tests.

(2) In preparing for a Master of Library Science degree program, students are advised to include courses distributed among the social sciences, biological and physical sciences, literature and other areas of the humanities, and also to major in one of these subjects.

(3) A reading knowledge of a modern language other than English is advisable. Reading knowledge is assumed if a student has completed French 200, German 200, Russian 300, or, at an equivalent level, any other modern language acceptable to the Faculty of Library Science. French, German, and Russian are particularly useful in bibliographic work.

(4) An applicant whose native language is not English is normally required to present a score of at least 600 in the Test of English as a Foreign Language (TOEFL) administered by Educational Testing Service, Box 593, Princeton, New Jersey 08540. Students should arrange for the testing agency to report results to the Faculty of Library Science, which will judge whether or not the results are satisfactory.

Having been designated as an official test centre, The University of Alberta is able to offer a series of TOEFL test administrations throughout the year. Six Special and six International examinations are held each year. Further information and application forms may be obtained from the Examinations and Timetabling Division, Office of the Registrar, Rm. 123, Administration Building, University of Alberta.

(5) All applicants with degrees from other countries must take the Graduate Record Examination Aptitude Tests administered by the Educational Testing Service. Students should arrange for the testing agency to report results to the Faculty of Library Science, which will judge whether or not the results are satisfactory.

(6) Preference is given to applicants who have had library experience under professional supervision before registration. Such experience tests a candidate's aptitude for library work and gives some knowledge of library terminology and processes.

(7) Applicants are judged not only upon their academic record but also by their professional promise as indicated in three letters of reference. A personal interview, arranged at a time and place convenient to the applicant, may also be required.

(8) Since there is a quota on the number of students in the Faculty of Library Science, The University of Alberta cannot guarantee admission to the Faculty for all fully qualified applicants.

204.46.6 APPLICANTS WITH THE B.L.S. DEGREE

Applicants with a B.L.S. degree from an accredited library school or its equavalent, and an academic record acceptable to the Faculty of Graduate Studies and Research and the Faculty of Library Science will normally be admitted as Candidates for the M.L.S. degree and should be able to complete the required work in one year.

Students who cannot enroll in at least three half-courses per term (full-time attendance), and whose employment relates directly to their academic studies, may petition the Faculty of Graduate Studies and Research to have the normal residency requirement waived. Petitions should be made through the Dean of the Faculty of Library Science.

204.46.7 APPLICATION FOR ADMISSION

All applicants are required to submit a Faculty of Graduate Studies and Research Application for Admission form to the Registrar. In addition, applicants who are not graduates of The University of Alberta are required to pay a $12.00 application fee and to arrange for the Registrars of the universities they attended to send official transcripts of their records to The University of Alberta Registrar.

Each applicant, when notified that his/her application has been accepted, shall pay a *deposit of $50.00* to The University of Alberta. This amount will later be applied on his/her fees if he or she registers, or be forfeited in full if he or she fails to register.

204.46.8 CLASSIFICATION OF LIBRARY SCIENCE STUDENTS

Students admitted to the first year of studies in library science are classified as qualifying graduate students. Upon completion of the first year of work students will be reclassified as either probationary graduate students or as candidates for a master's degree (Category A). See § 202.2.

Students admitted to the program who already hold the B.L.S. degree are classified as probationary graduate students or as candidates for a master's degree.

204.46.9 REGISTRATION

Particulars will be provided when a student is officially admitted to the Faculty. On entering the M.L.S. program, all students will be assigned a faculty advisor who will assist them in planning their course of studies.

204.46.10 ACADEMIC STANDING

The Faculty of Library Science adheres to the regulations of the Faculty of Graduate Studies and Research as outlined in § 202.4.

204.46.11 ACADEMIC APPEALS AND GRIEVANCES

A student who believes he or she has an academic grievance should first approach the instructor concerned. Failing satisfaction, he or she should then take his/her case to his/her Faculty advisor and then the Dean of the Faculty of Library Science and the Dean of the Faculty of Graduate Studies and Research in that order. Beyond this, the appeal should be made directly to the Academic Appeals Committee of the General Faculties Council. (See also § 16.7 "Appeals and Grievances" as found in the University Regulations and information for Students Calendar).

204.46.12 THE DEGREE OF M.L.S.

The Faculty of Library Science offers a two-year (four-term) program for university graduates leading to the degree of Master of Library Science (M.L.S.).

A full time student who is registered for the M.L.S. degree program will normally be able to complete degree requirements in two years. During the qualifying year students will be required to take five full courses or their equivalent (ten half courses). During the candidacy year students will be required to take the equivalent of ten half courses, and spend a minimum of two terms in full-time attendance. Students may, with approval, include up to two full courses in a faculty other than the Faculty of Library Science. The program includes provision for both a thesis and non-thesis option.

Credit for courses taken elsewhere may be granted as advanced credit by the Dean of the Faculty of Graduate Studies and Research on the recommendation of the Faculty of Library Science provided that the courses have not been counted towards a previous degree or diploma. (Please note the special provision for applicants with the B.L.S. degree. See § 204.46.6)

Inquiries regarding program and course details and financial assistance other than University scholarships should be made to the Dean of the Faculty of Library Science. Inquiries about University scholarships should be made to the Student Awards Office.

204.46.13 GRADUATE COURSES

All of the following courses may not be offered each year. Interested students should contact the Faculty of Library Science for scheduling information.

THES 000. *Thesis.* Topic to be approved by Faculty.

LIB S 401. *Technical Services.* ★3 (First Term, 3-0-1). To introduce students to the mechanics of technical services including identification, acquisition, cataloguing, classification and circulation of library materials.

LIB S 402. *Building Library Collections.* ★3 (First Term, 3-0-0). To develop an analytical approach to collection building and to explore acquisition methods with particular reference to the Canadian scene. Prerequisite: LIB S 401.

LIB S 403. *Cataloguing and Classification.* ★3 (Second Term, 3-0-0). To prepare students to construct a catalogue and to describe and classify various forms of library materials for either manual or computerized library situations. Prerequisite: LIB S 401.

LIB S 411. *Reference Services.* ★3 (First Term, 2-1s-0). To understand the functions of reference services in libraries, and to become familiar with examples of major reference sources.

LIB S 412. *Storytelling.* ★3 (either term, 3-0-0). To enable students to select, prepare, and present stories.

LIB S 421. *Management of Library Organizations.* ★3 (First Term, 2-1s-0). To introduce representative management theories applicable to library organizations.

LIB S 423. *Archives Administration.* ★3 (variable, 3-0-2). To develop an understanding of archival records and their role in the field of information.

LIB S 431. *Canadian Materials: Special Aspects.* ★3 (First Term, 3-0-0). To survey the range of Canadian materials, and to enable students to evaluate these materials.

LIB S 432. *Survey of Materials for Children.* ★3 (First Term, 3-0-0). To develop knowledge and appreciation of materials for children.

LIB S 433. *Materials for Young Adults.* ★3 (First Term, 3-0-0). To survey current literature in all media forms which appeal to adolescents of junior and senior high school age.

LIB S 434. *Adult Materials: Readers and Services.* ★3 (Second Term, 3-0-0). To develop an awareness of the recreational, educational and professional library needs of adults (including the less specialised needs of the high school, college and university community), and of the materials available to meet the needs.

LIB S 435. *Materials in the Social Sciences.* ★3 (Second Term, 3-0-0). To understand the nature, function and communication patterns of social sciences and to be able to select, organize and effectively use the relevant materials. Prerequisite: LIB S 411.

LIB S 436. *Humanities in the Library.* ★3 (Second Term, 3-0-0). To understand the nature and function of the humanities and to be able to select, organize and effectively use the printed materials or objects relevant to the humanities. Prerequisite: LIB S 411.

LIB S 437. *Science Literature.* ★3 (Second Term, 0-3s-0). To introduce the literature and the nature of science to the non-scientist. Prerequisite: LIB S 411.

LIB S 441. *Public Libraries.* ★3 (Second Term, 3-0-0). To develop an understanding of public libraries and public library systems, their structure and management. Prerequisite: LIB S 421.

LIB S 442. *Academic Libraries.* ★3 (Second Term, 2-1s-0). To develop an understanding of the nature and functions of university and community and technical college libraries. Prerequisite: LIB S 421.

LIB S 444. *Special Libraries.* ★3 (Second Term, 3-0-0). To develop an understanding of the special library, its purpose, structure and management with emphasis on services. Prerequisite: LIB S 421.

LIB S 445. *School Media Centres.* ★3 (Second Term, 3-0-0). To examine the concept and organization of media resource centres in elementary and secondary schools. Prerequisite: LIB S 421 and Teaching Certificate.

LIB S 451. *History of Libraries.* ★3 (First Term, 3-0-0). To examine the development of libraries and librarianship in response to social needs in the Western World.

LIB S 452. *History of the Book.* ★3 (Second Term, 3-0-0). To describe the historical, esthetic and economic bases of the book and its role in the recording and preservation of knowledge and ideas.

LIB S 461. *Practicum.* ★3 (0-3s-0). First Term: Use of Library Resources — To provide basic skills in using library and bibliographic resources. Second Term: Field Study — To provide opportunity for practical experience in a library under the direction and supervision of a qualified librarian. Required of students who have been admitted to the program without professional degree from an accredited library school.

LIB S 462. *Research and Systems Evaluation.* ★3 (Second Term, 3-0-0). To develop an ability to understand the nature of research and its methodologies and techniques used in librarianship.

LIB S 471. *Introduction to Automation and Libraries.* ★3 (Second Term, 3-0-0). To provide an introduction to, and an understanding of, the general field of automation and its implications for libraries.

LIB S 472. *Publishing.* ★3 (either term, 3-0-0). To examine the organized business of writing, manufacturing and marketing books and other media.

LIB S 473. *The Film.* ★3 (variable, 3-0-0). To select and to effectively use films in any types of library situation.

LIB S 501. *Comparative Cataloguing.* ★3 (Second Term, 3-0-0). To prepare students to specialize in cataloguing or indexing work in either a traditional or computerized library situation. Prerequisite: LIB S 403.

LIB S 502. *Comparative Classification.* ★3 (First Term, 3-0-0). To prepare students to specialize in classification work in either a traditional or computerized library situation. Prerequisite: LIB S 403.

LIB S 512. *Library Services to Children and Young Adults.* ★3 (Second Term, 3-0-0). To develop a knowledge of the principles and practices of library services to children and young adults. Prerequisite: LIB S 432 or 433.

LIB S 513. *Scientific Communication.* ★3 (First Term, 3-0-0). To look in depth at the science literature and other means used to communicate scientific information. Prerequisite: LIB S 437.

LIB S 514. *Communications and Libraries.* ★3 (Second Term, 0-3s-0). To examine communications media and assess their relevance to library and information services.

LIB S 521. *Library Buildings.* ★3 (First Term, 3-0-0). To study various types of library building needs, the involvement of librarians and architects in the planning process, and various contemporary building styles. Prerequisite: Either LIB S 441, 442, 443, 444, or 445.

LIB S 522. *Library Systems and Networks.* ★3 (First Term, 3-0-0). To consider models of systems and some examples of library cooperation from the simplest to the most sophisticated. Prerequisite: LIB S 421.

LIB S 523. *Records Management.* ★3 (variable, 3-1s-0). To develop an understanding of records management. Prerequisite: LIB S 423.

LIB S 524. *Personnel Management in Libraries.* ★3 (Second Term, 2-1s-0). To introduce the field of personnel management as an area of critical importance to librarianship. Prerequisite: LIB S 421.

LIB S 531. *Government Publications.* ★3 (First Term, 3-0-0). To examine Canadian government documents and to investigate methods of control and dissemination.

LIB S 532. *Informational Materials for Children and Young Adults.* ★3 (First Term, 3-0-0). To survey information materials that children and young adults use and the ways in which these materials are used. Prerequisite: LIB S 432 or 433.

LIB S 534. *Materials for Learning.* ★3 (Second Term, 3-0-0). To examine the nature of learning materials and the programs in which they are used from the viewpoint of the librarian. Prerequisite: LIB S 432, 433, or 434.

LIB S 542. *School Media Systems.* ★3 (Second Term, 3-0-0). To examine the organization and service at provincial, regional and district levels. Prerequisite: LIB S 445.

LIB S 552. *Bibliography: Historical, Descriptive, Enumerative.* ★3 (First Term, 3-0-0). To introduce the various aspects of the study of "the book" as an object, and its role in contemporary scholarship. Prerequisite: LIB S 452 or permission of the instructor.

LIB S 553. *Contemporary Issues for Librarianship.* ★3 (Second Term, 0-3s-0). To consider new and continuing topics of concern or debate in the library profession and how they influence library attitudes and programs.

LIB S 554. *Comparative Librarianship.* ★3 (Second Term, 3-0-0). To study the international aspects of librarianship and to increase students' understanding of the objectives and potentials of library sciences.

LIB S 557. *Special Topics in Librarianship.* ★3 (either term, 3-0-0). A current topic or issue significant for librarianship or a special aspect of librarianship, may be examined, as demand and resources permit.

LIB S 563. *Directed Study.* ★3 (either term, 0-3s-0). To assist students in further study of special topics and issues based on knowledge acquired in previous courses or on significant prior experience. Topics to be approved by Faculty.

LIB S 571. *Automation and Libraries.* ★3 (First Term, 3-0-0). To develop student's ability to design, evaluate, and implement typical automated procedures related to library and information centre.

LIB S 900. *Non-Thesis Project.* ★3 (variable). To assist students in the non-thesis route with a major project. Topic to be approved by Faculty.

204.47 *Linguistics*

204.47.1 THE DEGREES OF M.SC. AND PH.D.

(1) Programs in experimental linguistics leading to the degrees of Master of Science and Doctor of Philosophy are open to suitable graduates in such fields as linguistics, psychology, speech pathology, audiology, physiology, bio-engineering, computing science or physics, who meet the requirements of the Faculty of Graduate Studies and Research.

(2) Admission to a graduate program requires satisfactory completion of certain core courses in linguistics or their equivalents. Candidates who lack this preparation may expect to undertake a year of qualifying studies before being admitted to a degree program.

(3) A student accepted for a graduate program may specialize either in psycholinguistics or in speech production and perception.

(4) All graduate students are encouraged to develop special interests through attendance at the departmental research seminar and participation in departmental research.

(5) Requirements for the M.Sc. include a minimum of three and one-half full courses plus thesis. Specific courses must be chosen in consultation with the student's supervisory committee.

(6) Requirements for the Ph.D. include completion of the M.Sc. degree in linguistics or its equivalent and a minimum of three and one-half full courses plus thesis. Specific courses must be chosen in consultation with the student's supervisory committee.

(7) The Department offers a limited number of graduate assistantships. Graduate students are also eligible for various University fellowships, scholarships, and bursaries.

(8) Further information concerning programs in linguistics and financial aid may be obtained from the Graduate Advisor, Department of Linguistics.

(9) Application forms for admission to Graduate Studies, and information on University fellowships, scholarships, and bursaries may be obtained from the Dean of the Faculty of Graduate Studies and Research.

204.47.2 GRADUATE COURSES

THES 000. *Thesis.*

LING 521. *Psycholinguistics.* ★3 (First Term, 3-0-0).

LING 522. *Speech Production and Perception.* ★3 (Second Term, 3-0-0).

LING 541. *Quantitative Methods in Linguistics.* ★3 (either term, 3-0-0).

LING 551. *Seminar in Phonological Theory.* ★3 (First Term, 0-3s-0).

LING 552. *Seminar in Syntactic Theory.* ★3 (Second Term, 0-3s-0).

LING 583. *Experimental Methods in Linguistics I.* ★3 (First Term, 0-1s-3).

LING 584. *Experimental Methods in Linguistics II.* ★3 (Second Term, 0-1s-3).

LING 599. *Special Problems Course.* ★3 (First Term, 0-3s-0).

LING 605. *Foundations of Linguistic Theory.* ★3 (either term, 3-0-0).

LING 621. *Seminar in Linguistic Analysis of Aphasic Language.* ★3 (either term, 0-3s-0).

LING 633. *Seminar in Language Acquisition.* ★3 (either term, 0-3s-0).

LING 635. *Advanced Topics in Psycholinguistics.* ★3 (either term, 0-3s-0).

LING 636. *Seminar in the Analysis of Meaning.* ★3 (either term, 0-3s-0).

LING 641. *Advanced Quantitative Methods in Linguistics.* ★3 (either term, 3-0-0).

LING 651. *Departmental Research Seminar I.* ★3 (First Term, 0-3s-0).

LING 652. *Departmental Research Seminar II.* ★3 (Second Term, 0-3s-0).

LING 665. *Instrumentation in Experimental Linguistics I.* ★3 (First Term, 3-0-0).

LING 666. *Instrumentation in Experimental Linguistics II.* ★3 (Second Term, 3-0-0).

LING 667. *Articulation Control Mechanisms.* ★3 (either term, 3-0-0).

LING 669. *Speech Perception Mechanisms.* ★3 (either term, 3-0-0).

LING 683. *Conference Course I.* ★3 (First Term, 0-3s-0).

LING 684. *Conference Course II.* ★3 (Second Term, 0-3s-0).

INT D 623. *Clinical Research Seminar in Aphasia.* ★3 (either term, 3-0-3).

204.48 Mathematics

204.48.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Mathematics Department offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy in a number of fields, including Algebra, Approximation Theory, Classical Analysis, Continuum Mechanics, Control Theory, Combinatorics and Graph Theory, Ordinary and Partial Differential Equations, Functional Analysis, Statistics, Number Theory, Relativity, Topology, Mathematical Biology.

(2) Candidates for the M.Sc. must have an Honors degree or equivalent from a recognized university, with a strong background in Mathematics and/or Statistics. Candidates holding a Pass degree will be required to take additional courses either concurrently with their graduate program or prior to admission as a M.Sc. candidate.

(3) The minimum requirement for the M.Sc. degree is either six single-term graduate courses (or equivalent) and a thesis or eight single-term graduate courses (or equivalent), and a project. Approval of the chairman of the Mathematics Department is needed to take graduate courses that are not in Mathematics or Statistics. The M.Sc. program will normally be completed in 20 months but it can be done in a minimum of one year.

(4) To be admitted as a provisional candidate for the Ph.D., a student must normally hold the equivalent of the M.Sc. in Mathematics from The University of Alberta. In addition to the examinations called for by the general regulations, a qualifying exam must be taken at the end of the first year as a provisional candidate. The principal requirement for the Ph.D. is a substantial contribution to knowledge, embodied in a thesis. Except in very special cases every Ph.D. student will be required to take a minimum of seven graduate courses after the B.Sc. (Honors) degree or equivalent. In any case, one of these courses must be a full year 500-level or 600-level Mathematics course in an area other than that of the student's thesis. The program of a full-time student who is a Provisional Candidate for the Ph.D. shall normally include at least three mathematics courses, or courses in approved or allied fields (graduate or undergraduate) in the first year, at least two in the second year, and at least one in each additional year. Candidates will spend at least two years in advanced study and research after the master's degree.

(5) Courses taken in other departments depend upon the field of interest of the candidate.

(6) Candidates for the Ph.D. degree must satisfy the Department that they have a competent reading knowledge of two of French, German, or Russian.

(7) Graduate Assistantships are available for candidates working towards a higher degree. They involve at most twelve hours of work per week including teaching, class preparation and working time. Research Grant Assistantships are also available.

(8) Prospective graduate students should consult both the Chairman of the Department and the staff member in charge of the field in which they are particularly interested.

(9) Each student, on admission for graduate work in the Department, will have an advisory committee. The committee will determine, supervise and modify the student's program of study and research. In order to qualify for a degree, the student must satisfy the general requirements of the Faculty of Graduate Studies and Research, and the special departmental requirements described above, and must satisfactorily complete the program set up for him/her by the advisory committee.

204.48.2 PROGRAMS IN MATHEMATICAL PHYSICS

(1) The Master of Science and Doctor of Philosophy degrees in Mathematical Physics may be taken in the Mathematics Department by a student with a good background in both Mathematics and Physics.

(2) Candidates with an Honors degree in Mathematics will be required to complete a thesis or project on some topic in the field of theoretical, rather than experimental Physics, or in Applied Mathematics. The program of graduate courses will be selected in consultation with the Chairmen of the Departments of Mathematics and Physics.

(3) Candidates who have a B.Sc. in the Mathematics pattern of the general program, with three or more courses in Physics, may be accepted for a two-year M.Sc. program in Mathematical Physics. The general conditions of § 204.48.1 Para. (3) will apply.

204.48.3 PROGRAMS IN STATISTICS

(1) The Master of Science and Doctor of Philosophy degrees in Mathematical Statistics may be taken in the Mathematics Department.

(2) Candidates for the M.Sc. degree with an Honors degree in Mathematics will be required to take at least two graduate courses in theoretical statistics, at least one other mathematics course, and to complete a thesis or project on some topic in this field.

(3) Candidates with a general B.Sc. in Mathematics may be accepted for a two-year M.Sc. program if their pattern has included Statistics 255 and Statistics 450 or their equivalent. The general conditions of § 204.48.1, Para. (4) will apply.

204.48.4 GRADUATE COURSES

THES 000. *Thesis.*

Mathematics

A selection of courses, depending on demand, will be made from the following list:

MATH 502. *History of Mathematics.* ★6 (3-0-0). The Alexandria School and the foundations of geometry. Saccheri and the beginnings of modern geometry. The renaissance of algebra in Europe, the Arabic heritage. Cartesian, metric and projective geometries. Development of calculus and mechanics. Logical foundations of mathematics. Prerequisite: MATH 308 and 366 or consent of the Department.

MATH 503. *Integral Transforms.* ★3 (either term, 3-0-0). The Gamma and Hypergeometric Functions. The classical orthogonal polynomials, and the Bessel functions. Prerequisite: MATH 406 and 443 or equivalent.

MATH 504. *Special Functions.* ★3 (Second Term, 3-0-0). An introduction to the Laplace, Fourier, Mellin, and Hankel Transforms with a survey of their basic properties and certain applications. Prerequisites: MATH 406 and MATH 442/443 or equivalent.

MATH 505. *Number Systems.* ★6 (3-0-0). The development of the number system from the natural numbers to the complex

numbers. Proofs and definitions by induction. General sums and products. Decimal expansion of a real number. Finite, countable, and uncountable sets. Cardinal numbers. Well-ordered sets, ordinal numbers. Prerequisite: MATH 425.

MATH 506. *Complex Variables II—A.* ★3 (First Term, 3-0-0). Cauchy's Theorem, analytic continuation, Riemann surfaces and the monodromy theorem. Normal families, schlicht functions, conformal transformations and Riemann mapping theorem. Symmetry principle of Schwartz. Prerequisite: MATH 406.

MATH 507. *Complex Variables II—B.* ★3 (First Term, 3-0-0). Modular functions, Picard's theorem, Bioch's theorem, entire and meromorphic functions. Dirichlet series, selected topics from analytic number theory, approximation theory and potential theory. Prerequisite: MATH 506.

MATH 511. *Elementary Number Theory II.* ★3 (First Term, 3-0-0). Arithmetic functions, Dirichlet and unitary convolution, generating series, average order of magnitude and some standard functions. Distribution of the primes, theorems of Chebychev and Mertens, Selberg's Theorem, elementary proof of the prime number theorem, primes in arithmetic progressions. Partitions; generating functions and combinatorial methods. Prerequisite: MATH 427 or equivalent.

MATH 512. *Algebraic Number Theory.* ★3 (Second Term, 3-0-0). Valuations and their extensions, ramifications; integral dependence, algebraic number fields, ideals and divisors, class number. Prerequisite: MATH 425.

MATH 513. *Additive Number Theory.* ★3 (Second Term, 3-0-0). Addition of sequences, density theorems, essential components, complementary sequences, bases, B sequences, representation of theorems, arithmetic progressions. Prerequisite: MATH 427 or 511.

MATH 514. *Analytic Number Theory.* ★3 (Second Term, 3-0-0). Analytic proof of the prime number theorem, Weiner-Ikehara theorem; the Hardy-Ramanujan circle method and its applications to partitions and Waring's problem. Prerequisites: MATH 406, and 427 or 511.

MATH 517. *Introduction to Functional Analysis.* ★3 (First Term, 3-0-0). Metric spaces. Completeness and compactness. Fixed points. Continuous operators and metric spaces. Linear and non-linear spaces. Hilbert spaces. Linear operators and functionals. Approximate solutions of functional equations. Prerequisite: MATH 453 or consent of the Department. Note: Not open to Honors or Graduate students of Mathematics.

MATH 518. *Functional Analysis I.* ★3 (either term, 3-0-0). Locally convex spaces, metrizability. Normed linear spaces and examples. Hahn-Banach Theorem. Open mapping theorem. Principle of uniform boundedness. Weak and weak* topologies on Banach spaces. Reflexive Banach spaces. Hilbert space theory. Prerequisite: MATH 443 or consent of the Department.

MATH 519. *Functional Analysis II.* ★3 (either term, 3-0-0). Spectrum and resolvent. Fredholm theory of compact operators. Spectral theorem for bounded self-adjoint linear operators. Banach algebras. Operator alegebras. Weak compactness and geometry of Banach spaces. Prerequisite: MATH 518 and MATH 543 or consent of the Department.

MATH 520. *Differential Geometry.* ★6 (3-0-0). Manifolds, differentiable structures and maps, vector bundles, tensor algebra, vector and tensor fields, exterior calculus, integral manifolds, integration, Riemannian metrics, connections, geodesics, curvature, De Rham theorem, Lie groups and Lie transformation groups, frame bundles, singularities of maps, applications. Prerequisite: Consent of the Department.

MATH 524. *Ordinary Differential Equations II—A.* ★3 (First Term, 3-0-0). Existence, extension and uniqueness theorems. Linear systems, stability theory, dynamical systems in the plane. Prerequisite: MATH 431 or equivalent.

MATH 525. *Ordinary Differential Equations II—B.* ★3 (Second Term, 3-0-0). Asymptotics; separation, comparison and oscillation theorems; periodic solutions, boundary value problems; functional differential and contingent equations. Prerequisite: MATH 524.

MATH 526. *Introductory Partial Differential Equations.* ★3 (either term, 3-0-0). Introduction to partial differential equations. First order equations. Classification of higher order equations. Hyperbolic (wave) equations. Elliptic equations and potential theory (Laplace equation). Parabolic (heat and diffusion) equations. Prerequisite: MATH 313 or 401/402 or 431 or equivalent; or consent of the Department. Note: This course is intended primarily for students in Science or Engineering, and concentrates on the practical construction of solutions as well as the determination of general properties of solutions. Graduate students in Mathematics who wish to obtain credit for this course must have consent of the Department.

MATH 527. *Intermediate Partial Differential Equations.* ★3 (either term, 3-0-0). Introduction to the theory of generalized functions. Sobolev spaces; Garding's inequality, existence and regularity theory for elliptic operators. Energy estimates; existence and uniqueness theory for hyperbolic operators. Qualitative properties of solutions. Prerequisite: MATH 436; corequisite: MATH 518; or consent of the Department. Note: This course is intended primarily for students in Mathematics. It is more theoretically oriented than MATH 526.

MATH 528. *Partial Differential Equations.* ★3 (either term, 3-0-0). Continuation of MATH 526 or MATH 527. Selection of topics will be at the instructor's option in consultation with the students, and may be chosen from the following: further study of elliptic, hyperbolic, and parabolic equations; systems of equations; integral transform methods of solution; integral equation methods; applications to boundary-and initial-value problems; nonlinear operators; approximation methods. Prerequisite: Consent of the Department.

MATH 532. *General Topology I.* ★3 (First Term, 3-0-0). Elementary concepts of topology, nets and filters. Continuity homeomorphisms, product and quotient spaces. Axioms of separation and countability. Compactness, metrization, connectedness.

MATH 533. *Algebraic Topology I.* ★3 (Second Term, 3-0-0). Elementary concepts of homotopy theory; fundamental groups and covering spaces. Simplicial homology.

MATH 534. *Introduction to the Theory of Approximation.* ★3 (First Term, 3-0-0). Polynomial interpolation, remainder formulae and error bounds. Best approximations in C, Lp and other norms. Degree of approximation by polynomials and trigonometric polynomials. Spline interpolation and approximation. Numerical differentiation, quadrature formulae and other applications to numerical analysis. Prerequisite: MATH 443.

MATH 535. *Linear and Non-Linear Approximation.* ★3 (Second Term, 3-0-0). Linear operators. Best approximation in general normed linear spaces. Rational interpolation and approximation. Splines and approximation of linear functionals. Computational aspects, Remes and Polya algorithms. Prerequisite: MATH 534.

MATH 542. *Fourier Analysis.* ★3 (either term, 3-0-0). Trigonometric series. Norm and pointwise convergence theorems. Fourier integral. Inversion theorems. Plancherel's theorem. Hausdorff-Young theorem. Summability of Fourier series. Wiener's Tauberian theorem. Prerequisite: MATH 443 or consent of the Department.

MATH 543. *Measure Theory.* ★3 (either term, 3-0-0). Abstract measures. Integration. L^p-spaces. Radon-Nikodym theorem. Hahn and Lebesgue decomposition theorems. Product measures. Fubini's theorem. Prerequisite: MATH 443 or consent of the Department.

MATH 550. *Generalized Dynamics and Special Relativity Theory.* ★6 (3-0-0).

MATH 554. *Theory of Elasticity.* ★6 (3-0-0). Stress, strain, stress-strain relations. Stretching, bending, torsion, and flexure of cylinders. Two-dimensional problems with an introduction to the work of Muskelvili. Introduction to three-dimensional problems. Variational methods. Prerequisite: MATH 408 or 406 or 500 or consent of the Department.

MATH 555. *Hydro- and Aero-dynamics.* ★6 (3-0-0). Classical hydrodynamics. Kutta-Joukowski theory of airfoils. Boundary layers. Flow of a viscous fluid. Supersonic flow. Shock waves. Prerequisite: Consent of the Department.

MATH 560. *Optimization Techniques.* ★3 (Second Term, 3-0-0). Theory and techniques of dynamic programming. Problems of LaGrange and Mayer. Computational methods resolving optimal problems. Prerequisite: MATH 453 or consent of the Department.

MATH 581. *Group Theory and Field Theory.* ★3 (First Term, 3-0-0). Solvable, nilpotent and free groups. Galois theory and valuation theory of fields. Further topics from the theory of groups and fields which may vary from year to year. Prerequisite: MATH 425.

MATH 582. *Rings, Modules and Categories.* ★3 (Second Term, 3-0-0). Noetherian rings, primary decomposition, localization. Injective and Projective Modules. Artin-Wedderburn theorem. Topics from homological algebra and category theory which may vary from year to year. Prerequisite: MATH 425.

MATH 600. *Reading in Mathematics.* ★3 (either term, 3-0-0). Students registered in this course are supervised by individual staff members in areas of interest of the staff members. Students will be allowed to take this course only in exceptional circumstances and with the permission of the Chairman of the Department. This course shall not be counted against the minimum course requirement for graduate students.

MATH 605. *Mathematical Logic.* ★4 (2-0-0). Sentential calculus; lower predicate calculus; Boolean algebra, structures, Godel's completeness theorem.

MATH 617. *Topics in Functional Analysis I.* ★3 (First Term, 3-0-0).

MATH 618. *Topics in Functional Analysis II.* ★3 (Second Term, 3-0-0).

MATH 624. *Combinatorial Analysis.* ★6 (3-0-0). Recurrence relations and generating series for combinatorial problems. Partitions and compositions. Trees and graphs. Ramsey's Theorem. Zero-one matrices and combinational designs.

MATH 626. *Topics in Number Theory I.* ★3 (either term, 3-0-0).

MATH 627. *Topics in Number Theory II.* ★3 (either term, 3-0-0).

MATH 632. *Algebraic Topology II.* ★3 (First Term, 3-0-0).

MATH 633. *General Topology II.* ★3 (Second Term, 3-0-0).

MATH 643. *Topics in Analysis.* ★3 (either term, 3-0-0).

MATH 644. *Topics in Measure Theory.* ★3 (either term, 3-0-0).

MATH 645. *Lattice Theory.* ★3 (either term, 3-0-0).

MATH 663. *Topics in Applied Mathematics I.* ★3 (First Term, 3-0-0).

MATH 664. *Topics in Applied Mathematics II.* ★3 (Second Term, 3-0-0).

MATH 666. *Topics in Mathematical Modelling.* ★3 (either term, 3-0-0).

MATH 667. *Topics in Differential Equations I.* ★3 (First Term, 3-0-0).

MATH 668. *Topics in Differential Equations II.* ★3 (Second Term, 3-0-0).

MATH 676. *Topics in Geometry I.* ★3 (First Term, 3-0-0).

MATH 677. *Topics in Geometry II.* ★3 (Second Term, 3-0-0).

MATH 678. *Ring Theory I.* ★3 (First Term, 3-0-0).

MATH 679. *Ring Theory II.* ★3 (Second Term, 3-0-0).

MATH 681. *Topics in Algebra.* ★3 (First Term, 3-0-0).

MATH 682. *Topics in Algebra.* ★3 (Second Term, 3-0-0).

MATH 692. *Topics in Group Theory.* ★3 (First Term, 3-0-0).

MATH 693. *Topics in Group Theory.* ★3 (Second Term, 3-0-0).

MATH 695. *Advanced Relativity Theory.* ★6 (3-0-0).

MATH 900. *Non-Thesis Project.* ★6.0 (Time equivalent to two single term courses.) Open only to students taking the M.Sc. non-thesis option in Mathematics.

204.48.5 GRADUATE COURSES

Mathematical Physics

MA PH 443. *Classical Mechanics I.* ★3 (First Term, 3-0-0). Review of fundamental principles; Lagrange's equations derived from Newton's Laws and D'Alembert's Principle; non-conservative and non-holonomic systems; central force problem; motion of a rigid body. Prerequisites: PHYS 343 or MATH 309; MATH 303 or 308.

MA PH 444. *Classical Mechanics II.* ★3 (Second Term, 3-0-0). Variational principles; Hamilton's equations; canonical transformations; Hamilton-Jacobi equation; principles of fluid mechanics. Prerequisite: MA PH 443 or consent of both Departments.

MA PH 467. *Mechanics of Deformable Media.* ★3 (Second Term, 3-0-0). Stress and strain in continuous media; elasticity; mechanics of fluid flow in 2 dimensions using complex variables; 3 dimensional fluid flow using Eulerian and Lagrangian reference frame; thermodynamics and mechanics of compressible and viscous flows; onset of turbulence, convection and instability. Examples from geophysics, oceanography and atmospheric physics. Prerequisites: PHYS 311, MATH 431, MA PH 443, MATH 405 or 408, or consent of the Department.

MA PH 551. *Mathematical Methods of Physics I.* ★3 (First Term, 3-0-0). Application to problems in physics of: method of steepest descents; Fourier and Laplace transforms; boundary-value problems, integral equations and Green's functions. Prerequisites: PHYS 471 and 482, or consent of both Departments.

MA PH 553. *Mathematical Methods of Physics II.* ★3 (Second Term, 3-0-0). Application to problems in physics of: contour integral solutions of linear differential equations; Legendre, Bessel and hypergeometric functions with complex arguments; applications to the differential and integral equations of mathematical physics; perturbation theory; calculus of variations; conformal mapping; elements of group theory. Prerequisite: MA PH 551 or consent of both Departments.

MA PH 568. *Introduction to Relativity.* ★3 (Second Term, 3-0-0). Special Relativity, principle of equivalence, Einstein field equations, stationary and static fields, Schwarzschild metric, experimental tests, black holes, linearized equations, gravitational collapse, cosmology. Prerequisite: MATH 466 or equivalent.

MA PH 669. *General Relativity.* ★6 (3-0-0). Algebraic analysis of the field equations, Cauchy initial value problem, gravitational radiation, algebraically special fields, conservation laws, gravitational collapse and black holes. Relativistic astrophysics, cosmological models, global structure of space-time. Prerequisite: MATH 466 or consent of both Departments.

204.48.6 GRADUATE COURSES

Statistics

STAT 558. *Techniques of Statistical Analysis I.* ★3 (First Term, 3-0-0).

STAT 559. *Techniques of Statistical Analysis II.* ★3 (Second Term, 3-0-0). The contents of these courses will be selected each year from such applied topics as: Sampling methods, Multivariate analysis, Nonparametric methods, Combinatorial methods and Analysis of Design. Prerequisites: STAT 450 or 471 or 466 or equivalent, and consent of the Department.

STAT 561. *Sample Survey Methodology.* ★3 (either term, 3-0-0). Simple random sampling. Stratified random sampling. Ratio and regression estimates. Cluster sampling single stage, two stage and multistage sampling. Systematic sampling. Prerequisite: STAT 466 or consent of the Department.

STAT 563. *Theory of Games.* ★3 (either term, 3-0-0). Games in normal and extended form. Methods of solution. Statistics games. Minimax strategies. Bayes procedures. Linear programming. Prerequisite: STAT 471 or consent of the Department.

STAT 566. *Mathematical Methods of Statistics I.* ★3 (Second Term, 3-0-0). Probability distributions; Exponential family of distributions. Completeness Uniformly minimum variance unbiased, maximum likelihood, and other estimators. Neyman-Pearson lemma, UMP-tests, sequential tests, UMP similar and unbiased tests. Confidence regions. Concepts of Decision Theory. Prerequisites: STAT 466 and 571 or consent of the Department.

STAT 567. *Mathematical Methods of Statistics II.* ★3 (First Term, 3-0-0). Prior and posterior distributions. Bayes and minimax procedures. Invariant procedures. Bayesian inference for linear models. Prerequisite: STAT 566 or consent of the Department.

STAT 568. *Analysis of Variance.* ★3 (either term, 3-0-0). The general linear model. Confidence Ellipsoids and tests under normal theory. One and two way analysis of variance. Multiple comparisons. Complete higher-way models. Random effects models. Analysis of covariance. Prerequisite: STAT 466 or equivalent or consent of the Department.

STAT 569. *Experimental Design.* ★3 (either term, 3-0-0). Latin squares. Balanced and partially balanced incomplete blocks. Nested and partially nested models. Two level factorial experiments. Confounding higher level factorial designs. Prerequisite: STAT 568 or equivalent.

STAT 571. *Probability Theory I.* ★3 (First Term, 3-0-0). Probability spaces, introduction to measure and integration, random variables, types of stochastic convergence. Distribution functions and characteristic functions. Weak limit theorems. Prerequisite: STAT 472 or consent of the Department.

STAT 572. *Probability Theory II.* ★3 (Second Term, 3-0-0). Zero-one laws, three-series criterion, laws of iterated logarithm, Central Limit Problem, conditional expectation. Introduction to stochastic processes. Martingales and Markov processes. Prerequisite: STAT 571.

STAT 575. *Multivariate Analysis.* ★3 (First Term, 3-0-0). Multivariate normal distribution, estimation of the mean vector and the covariance matrix. The distribution of the sample co-

variance matrix and the sample generalized variance, Hotelling's T2. Discriminant analysis. Some statistical applications. Prerequisites: STAT 466 and MATH 381 / 382.

STAT 577. *Nonparametric Inference.* ★3 (Second Term, 3-0-0). Order statistics, rank-tests, Kolmogorov-Smirnov tests. Nonparametric estimation. Nonparametric problems of analysis of variance and of multivariate analysis. Tests for independence. Efficiency of tests and other large-sample properties. Other nonparametric procedures. Prerequisite: STAT 566 or consent of the Department.

STAT 578. *Regression Analysis.* ★3 (either term, 3-0-0). The general linear hypothesis. Ordinary least squares in multiple linear regression. Selecting the best regression equation. Generalized least squares. Partial and multiple correlation. Linear functional relationships when the independent variables are also random. Nonlinear estimation and models. Prerequisite: STAT 466.

STAT 579. *Time Series Analysis.* ★3 (either term, 3-0-0). The autocorrelation function and spectrum and their estimates. Linear stationary models; autoregressive, moving average, and mixed models. Linear nonstationary models; autoregressive integrated moving average models. Forecasting. Model identification and estimation. Spectral analysis. Prerequisite: STAT 466 or equivalent or consent of the Department.

STAT 580. *Stochastic Processes.* ★3 (either term, 3-0-0). Elements of stochastic processes. Discrete and continuous time markov Chains; Birth and Death processes. Branching processes. Brownian Motion. General Stationary and Markov processes. Examples. Prerequisite: STAT 471 or consent of the Department.

STAT 661. *Stochastic Processes I.* ★3 (First Term, 3-0-0).

STAT 662. *Stochastic Processes II.* ★3 (Second Term, 3-0-0).

STAT 666. *Topics in Statistics I.* ★3 (First Term, 3-0-0).

STAT 667. *Topics in Statistics II.* ★3 (Second Term, 3-0-0).

STAT 671. *Topics in Probability I.* ★3 (First Term, 3-0-0).

STAT 672. *Topics in Probability II.* ★3 (Second Term, 3-0-0).

STAT 900. *Non-Thesis Project.* ★6.0 (Time equivalent to two single term courses.) Open only to students taking the M.Sc. non-thesis option in Statistics.

204.48.7 GRADUATE COURSES

Physics

NOTE: The following courses are given in the Physics Department. Some of these may be selected as part of a graduate program in Mathematics.

PHYS 676. *Nuclear Structure I.* ★3 (either term, 3-0-0)..

PHYS 677. *Nuclear Structure II.* ★3 (either term, 3-0-0).

PHYS 680. *Advanced Quantum Mechanics.* ★6 (3-0-0).

PHYS 682. *Advanced Electromagnetic Theory I.* ★3 (First Term, 3-0-0).

PHYS 683. *Statistical Mechanics.* ★3 (First Term, 3-0-0).

PHYS 684. *Advanced Electromagnetic Theory II.* ★3 (Second Term, 3-0-0).

PHYS 685. *Quantum Field Theory I or II.* ★3 (Second Term, 3-0-0).

PHYS 688. *Solid State Theory.* ★6 (3-0-0).

PHYS 699. *Selected Topics in Theoretical Physics. I — Scattering Theory; II — Green's Function; Advanced Solid State Theory; III — Mechanics of Fluids and Other Continua.* ★3 (either term, 3-0-0).

204.49 Mechanical Engineering

204.49.1 THE DEGREES OF M.ENG., M.SC. AND PH.D.

(1) The Department of Mechanical Engineering offers postgraduate courses and provides research facilities for well-qualified students of recognized universities who wish to pursue advanced studies leading to the M.Eng., M.Sc., and Ph.D. Areas of study include Applied Mechanics, Thermodynamics, Fluid Mechanics, Gas Dynamics, Heat Transfer, Combustion, Design, Biomedical, Industrial Engineering and Welding Engineering and Oil Sands.

(2) The normal requirement for a Master of Engineering program is credit in ten single-term courses, five of which must be in the candidate's major field, plus a project equivalent to two single-term courses. A candidate may complete a Master of Engineering program in a minimum of nine months. The minimum residence required is one term for a B.Sc. graduate with at least one year of post-B.Sc. experience, and one session for a B.Sc. graduate with less than one year of post-B.Sc. experience. The maximum time permitted for completion of a Master of Engineering program is four years from the date of first registration.

(3) For the Master of Science program the candidate must have satisfactorily completed a minimum of five single-term courses (additional courses may be required on advice of student's supervisory committee), plus a thesis acceptable to the Department of Mechanical Engineering and the Faculty of Graduate Studies and Research.

(4) For the Ph.D. program, all requirements of the Faculty of Graduate Studies and Research must be met. In addition the Department normally requires that the candidate must have satisfactorily completed approved courses in a major field and at least one minor field. The minimum requirements after a Bachelor's degree are ten single-term courses, five of which must be in the major field, plus research leading to a thesis of high calibre. For those students entering the Ph.D. program after a Master's degree the minimum course requirement is five single-term post Master's courses. As part of the requirements for admission to candidacy for the Ph.D. the provisional candidate will normally have to pass departmental comprehensive examinations (either oral or written) embracing the major field which will be arranged in consultation with the Department. Candidates may also have to satisfy the Department that they have a reading knowledge of a foreign language selected by the advisory committee.

(5) In each of the programs certain courses are required by the Department. Lists and details of required courses may be obtained from the Department.

(6) Financial assistance is available in the form of scholarships and fellowships (see Awards section of this Calendar) and through the Department in the form of Graduate Assistantships and Contract Research (available for Canadian students and students holding a valid work permit). The assistantships are available on a full-time or part-time basis with remuneration according to the student's qualifications and the hours of service. Summer assistance can usually be arranged for students without scholarship support who continue their research through the summer months.

204.49.2 UNDERGRADUATE COURSES

The following specialization electives may be taken for graduate credit:

MEC E 512. *The Design and Implementation of Production Systems.* ☐3.5 (First Term, 3-1s-0). (★3.)

MEC 513. *The Scheduling and Control of Production Systems.* ☐3.5 (Second Term, 3-1s-0). (★3.)

MEC E 522. *Power Plant Engineering.* ☐3.0 (First Term, 3-0-0). (★3.)

MEC E 531. *Fluid Mechanics II.* ☐3.0 (Second Term, 3-0-0). (★3.)

MEC E 537. *Aerodynamics.* ☐3.0 (First Term, 3-0-0). (★3.)

MEC E 541. *Combustion Engines.* ☐3.0 (First Term, 3-0-0). (★3.)

MEC E 543. *Energy Conversion.* ☐3.0 (Second Term, 3-0-0). (★3.)

MEC E 552. *Advanced Vibrations.* ☐3.0 (Second Term, 3-0-0). (★3.)

MEC E 553. *Acoustics and Noise Control.* ☐3.0 (Second Term, 3-0-0). (★3.)

204.49.3 GRADUATE COURSES

THES 000. *Thesis.*

The courses Mechanical Engineering 610, 630, 640, 650, 670, 681 and 684 normally will be offered annually. Other courses will be offered on a lecture basis when the number of students registered warrants it; otherwise they may be offered on a guided reading basis.

MEC E 601. *Graduate Seminar.* ☐0.5 (0-1s-0). (★.5.)

MEC E 605. *Experimental Strain Analysis.* ☐3.0 (First Term, 3-0-0). Basic experimental methods used in engineering mechanics including photoelasticity, strain gauges, brittle coatings; measurement in static, dynamic and transient system, ultrasonics; laboratory exercises. (★3.)

MEC E 610. *Engineering Economic Analysis.* ☐3.0 (Second Term, 3-0-0). Engineering, financial and intangible factors influencing management decisions for expenditure of funds. The sources and application of funds and the evaluation of risk capital investment decisions. Prerequisite: MEC E 413, or equivalent. (★3.)

MEC E 611. *Quantitative Methods for Industrial Systems I.* ☐3.0 (First Term, 3-0-0). Case studies in industrial problems. Methods and theories in operations research. (★3.)

MEC E 612. *Quantitative Methods for Industrial Systems II.* ☐3.0 (Second Term, 3-0-0). Non-linear models applied to management decisions. (★3.)

MEC E 613. *The Total Design of Operating Systems.* ☐3.0 (Second Term, 3-0-0). This course covers the design concepts for any size or type of management systems. Among the topics to be considered are environmental control, small group dynamics, concepts of models, concepts of systems, management policies. A group design project will be undertaken. (★3.)

MEC E 620. *Combustion.* ☐3.0 (First Term, 3-0-0). Chemical reactions, chemical equilibrium and flame temperatures. Flame propagation and explosion theories. Detonations. Air pollution from combustion sources. (★3.)

MEC E 628. *Reading Projects in Advanced Applied Thermodynamics.* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 629. *Reading Projects in Advanced Applied Thermodynamics.* ☐6.0 (3-0-0). Combustion, Refrigeration. (★6.)

MEC E 630. *Introduction to Viscous Flow.* ☐3.0 (First Term, 3-0-0). Laminar incompressible flow; simple exact solutions; the low Reynolds number range; the large Reynolds number range; approximate methods. (★3.)

MEC E 632. *Turbulent Fluid Dynamics.* ☐3.0 (Second Term, 3-0-0). Governing equations of turbulent flow. Statistical and phenomenological theories of turbulent transport of momentum, heat, and mass in wall-bounded and free flows. Computational techniques, empirical data and applications. (★3.)

MEC E 635. *Gas Dynamics.* ☐3.0 (First Term, 3-0-0). Equations of motion; compressible fluid flow; shock waves; one dimensional flow with friction and heat transfer; real gas effects; method of characteristics; multidimensional flow. (★3.)

MEC E 638. *Reading Projects in Advanced Fluid Dynamics.* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 639. *Reading Projects in Advanced Fluid Dynamics.* ☐6.0 (3-0-0). Aerodynamics, Rarified Gas Dynamics, Turbulence, Hydro and Thermo Stability. (★6.)

MEC E 640. *Analytical Thermodynamics.* ☐3.0 (First Term, 3-0-0). Extension of classical thermodynamics, statistical thermodynamics applied to engineering systems. Irreversible thermodynamics, thermoelectricity, and thermo-diffusion. (★3.)

MEC E 648. *Reading Projects in Advanced Thermodynamics.* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 649. *Reading Projects in Advanced Thermodynamics.* ☐6.0 (3-0-0). Energy conversion, General Thermodynamics, Irreversible Thermodynamics. (★6.)

MEC E 650. *Analytical Dynamics.* ☐3.0 (First Term, 3-0-0). Principle of virtual work, Lagrange's equations of motion for holonomic and non-holonomic systems, Hamilton's principle, application to gyroscopes, stabilizers, etc. (★3.)

MEC E 652. *Nonlinear Oscillations.* ☐3.0 (Second Term, 3-0-0). Phase plane, singular points, non-linear conservative systems, limit cycles, stability, perturbation method, non-linear resonance. (★3.)

MEC E 655. *Dynamics of Structures.* ☐3.0 (Second Term, 3-0-0). Behavior of elastic structures subjected to dynamic loads. Vibrations of buildings and bridges excited by machinery, earthquakes, wind and traffic. (★3.)

MEC E 658. *Reading Projects in Advanced Dynamics.* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 659. *Reading Projects in Advanced Dynamics.* ☐6.0 (3-0-0). Wave Propagation, Orbital Dynamics. (★6.)

MEC E 660. *Design of Mechanical Systems I.* ☐3.0 (First Term, 3-0-0). A critical analysis of some existing mechanical systems. (★3.)

MEC E 661. *Design of Mechanical Systems II.* ☐3.0 (Second Term, 3-0-0). A critical analysis of some existing mechanical systems. (★3.)

MEC E 664. *Techniques of Mechanical Design.* ☐3.0 (Second Term, 3-0-0). Techniques of optimization; applications to specific problems of mechanical design. Linear and nonlinear programming. Reliability mathematics; relation of factor of safety to reliability; statistical nature of design. Computer-aided design. (★3.)

MEC E 670. *Advanced Heat Transfer.* ☐3.0 (Second Term, 3-0-0). Advanced topics in conduction and convection heat transfer, solution by analytical and numerical methods. (★3.)

MEC E 671. *Laminar Convection.* ☐3.0 (Second Term, 3-0-0). General theory of convection systems. Forced and free convection for laminar conditions. Internal and external flows. (★3.)

MEC E 672. *Thermal Radiation.* ☐3.0 (First Term, 3-0-0). Principles of radiant energy transfer. Gaseous radiation. Spectral characteristics. Geometrical characteristics of systems involving thermal radiation. Electrical analogy. (★3.)

MEC E 678. *Reading Projects in Advanced Heat Transfer.* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 679. *Reading Projects in Advanced Heat Transfer.* ☐6.0 (3-0-0). Conduction, Convection, Radiation. (★6.)

MEC E 680. *Continuum Mechanics.* ☐3.0 (First Term, 3-0-0). Analysis of deformation, analysis of stress including Piola-Kirchhoff stress tensors, virtual work, energy balance, entropy inequality, constitutive equations, equations of classical elasticity, thermoelasticity, viscous flow. (★3.)

MEC E 681. *Elasticity.* ☐3.0 (Second Term, 3-0-0). Extension, torsion and flexure of beams, two dimensional problems, complex variable methods, integral transform methods, variational methods. (★3.)

MEC E 682. *Plasticity.* ☐3.0 (Second Term, 3-0-0). Yield condition, plastic potential, elastic-plastic problems, characteristic theory, slip line fields, plane stress anisotropy. (★3.)

MEC E 683. *Plates and Shells.* ☐3.0 (First Term, 3-0-0) Solutions of the plate equation for rectangular and circular plates with various boundary conditions; special and approximate methods; membrane theory of shells; bending theory of cylindrical shells. (★3.)

MEC E 684. *Static and Dynamic Stability.* ☐3.0 (Second Term 3-0-0). Classical stability analysis of bars and plates subjected to various loading conditions. Energy methods. Dynamic stability of non-conservative force systems and the effects of internal friction. Ineiastic buckling, torsional buckling. (★3.)

MEC E 685. *Macro Fracture Mechanics.* ☐3.0 (Second Term 3-0-0). Engineering approach to fracture prediction; Fracture toughness; Fracture criteria; Crack initiation; Initiation barrier. Effect of speed of crack propagation; Crack Opening Displacement (C.O.D.) and the J Intregal as a measure of fracture toughness; Design criteria and applications. (★3.)

MEC E 688. *Reading Projects in Advanced Solid Mechanics* ☐3.0 (either term, 3-0-0). (★3.)

MEC E 689. *Reading Projects in Advanced Solid Mechanics* ☐6.0 (3-0-0). Elastic Plasticity, Viscoelasticity, Shells. (★6.)

MEC E 900. *Non-Thesis Project.* ☐6.0 (Time equivaient to two single-term courses). Detailed engineering report in the students' major area of interest. (★6.)

204.50 Medical Bacteriology

204.50.1 THE DEGREE OF M.SC.

(1) The Department offers programs leading to the degree of Master of Science after one or more years, depending on prior training.

(2) The Department of Medical Bacteriology is one of six departments working jointly to offer a Ph.D. in Medical Sciences. Preference is given to those with an M.D. degree who wish to obtain training for a career in clinical research. Highly qualified candidates who wish to proceed to a Ph.D. will be considered.

(3) Excellent facilities and equipment are available for research in Medical Bacteriology. Research interests of the staff include: classification of fungi; bacterial ultrastructure; structure and function of anaerobic bacteria, mycoplasma, chlamydia; antimicrobial resistance in bacteria; transport of antimicrobial agents; mechanisms of pathogenicity; etiology on non-gonococcal urethritis, application of gas-liquid chromatography to the identification of microorganisms. The Muttart Foundation Neurovirology Research Unit is located within the department. Basic and applied research is being carried out on the role of certain viruses (paramyxovirus, herpes virus, parvovirus) in neurological disorders.

(4) Students considering a graduate program in Bacteriology should contact the Chairman of the Department as early as possible in the year preceding enrolment. Most applications for financial support are made in November.

204.50.2 GRADUATE COURSES

THES 000. *Thesis.*

BACT 501. *Microbiology Literature Review.* ★3 (either term, 3-0-0). A supervised course dealing with current ideas in Microbiology. Students attend discussion sessions in the Department and prepare seminars.

BACT 504. *Medical Mycology.* ★3 (First Term, 1-0-3). Laboratory study of the fungi which cause disease in man. Methods for the demonstration, isolation and identification of pathogenic fungi. Some attention will also be given to the epidemiology, serology and pathology of fungus diseases. Prerequisite: A course in medical bacteriology.

BACT 505. *Mechanisms of Pathogenicity.* ★3 (First Term, 3-0-3). A functional approach to the production of disease by microbes emphasizing biochemical, immunological and physiological properties of host and microbe which account for a pathological process. Prerequisites: Introductory bacteriology or microbiology and biochemistry or consent of the Department.

BACT 506. *Topics in Advanced Diagnostic Microbiology.* ★3 (Second Term, 2-0-4). Designed for advanced undergraduate and graduate students in Science and in Medicine. New approaches, and problem handling in diagnostic microbiology, Examples used will be the organisms of the genital tract with emphasis on agents of sexually transmitted disease. Prerequisites: BACT 361 or MICRB 365 and the consent of the Department.

BIOL 507. *Taxometrics.* ★3 (First Term, 3-0-0). Theoretical and practical aspects of quantitative classification. Use of TAXMAP and other computer programs. Prerequisite: Consent of the Department.

BACT 508. *Special Projects.* ★3 (either term, 0-0-3). Individual projects supervised by a faculty member.

BACT 509. *Special Projects.* ★3 (either term, 0-0-3). Individual projects supervised by a faculty member.

BACT 510. *Special Projects.* ★3 (either term, 0-0-3). Individual projects supervised by a faculty member.

BACT 511. *Special Projects.* ★3 (either term, 0-0-3). Individual projects supervised by a faculty member.

BACT 512. *Special Projects.* ★3 (either term, 0-0-3). Individual projects supervised by a faculty member.

BACT 530. *Biological Techniques in Electron Microscopy.* ★3 (either term, 1-0-5). Biological techniques in Electron Microscopy with special emphasis on those which apply to medical microbiology. The course will include theory and use of the electron microscope, preparation of microbiological and biological material for examination by electron microscopy using various basic techniques, photography and other related topics. Prerequisite: A university course in basic biology or microbiology and consent of the Department of Medical Bacteriology.

BACT 531. *Advanced Biological Techniques in Electron Microscopy.* ★3 (either term, 1-0-5). Advanced biological techniques in Electron Microscopy with special emphasis on those which apply to medical microbiology. The course will include an extension of techniques covered in BACT 530 and will include more advanced techniques of specimen preparation and use of the electron microscope. Prerequisite: BACT 530 (or adequate previous experience in electron microscopy of biological materials) and consent of the Department of Medical Bacteriology.

204.51 Medical Sciences

204.51.1 THE DEGREE OF PH.D.

(1) The Departments of Immunology, Medical Bacteriology, Medicine, Pathology, Pediatrics and Psychiatry are participating in an interdisciplinary Ph.D. program in the medical sciences. This program has as its objective the training of medical research scientists who are strongly motivated to pursue a medical research career in areas of ultimate clinical relevance.

(2) Candidates with either bachelors, masters and or medical degrees are encouraged to apply. Strong academic record is required. Candidates should prepare themselves for the program by taking the basic science courses: Chemistry, Physics, Biochemistry, Genetics, Statistics, etc. necessary for the program they have in mind. They should also identify the department they wish to work in, and preferably a faculty member within that department with whom they wish to work. The department and the applicant can then make a joint submission to the program.

(3) Requirements for the Ph.D. will be tailor-made to each applicant and are determined by the committee as a whole. In general the Ph.D. program will take at least three years with the first year devoted to course work and a qualifying exam in the field of the candidate's choice.

(4) Financial assistance is available to support this program but applications should be made at least nine months in advance. Otherwise arrangements for assistance may be made through individual departments or sponsors.

(5) Additional inquiries should be directed to the Assistant Dean, Scientific Affairs, Faculty of Medicine, 13-117 Clinical Sciences Building, The University of Alberta, T6G 2G3.

204.52 Medicine

204.52.1 THE DEGREE OF M.SC.

(1) The Department of Medicine offers the Degree of M.Sc in Experimental Medicine either as part of a co-ordinated pattern of training leading to fulfilment of requirements for graduate training in the medical specialities, or as a separate program for those proceeding from a B.Sc.

(2) Research may be carried out in either basic or clinical sciences and may be either theoretical or applied in nature.

(3) Such course work is required as may be necessary for the proper understanding and carrying out of the research work and preparing the thesis. Advanced credit may be granted in appropriate cases for courses taken during the latter years of the M.D. program, at the discretion of the candidate's supervisor.

(4) For candidates holding the M.D., the program's minimum requirement would be one calendar year of residence. For other candidates a qualifying year may be required.

(5) Limited financial assistance is available to support these programs, but applications should be made at least twelve months in advance.

(6) Inquiries should be directed to the Chairman of the Department of Medicine, Clinicial Sciences Bldg., The University of Alberta.

204.53 Medicine and Clinical Medicine

204.53.1 GRADUATE COURSES

MED 501. *Clinical Pulmonary Physiology.* ★3 (Second Term, 2-0-0). Basic and clinical lectures on: Lung Structure; Pulmonary Blood Flow; Airflow; Gaseous Diffusion; Ventilation Perfusion Matching; Control of Ventilation; Oxygen Transport; Lung Defense; Mucociliary Transport; ARDS; Asthma. Exercise; Lung Growth; Surfactant; Lung Metabolism. Pulmonary Function Testing. Prerequisite: General courses in physiology, physics and biochemistry or consent of the Department.

204.54 Meteorology
Department of Geography

204.54.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Geography offers programs leading to the M.Sc. and Ph.D. degrees in Meteorology.

(2) Two separate programs lead to the M.Sc. degree with specialization in Meteorology. Prerequisite to either program is an Honors B.Sc. degree or equivalent with adequate preparation in Mathematics and Physics.

(3) The program of studies for the degree of M.Sc. (Geography) with specialization in Meteorology requires four full-term courses (or equivalent) in Meteorology and Climatology, and a thesis. These should include Meteorology 406, 407 and 511, and Geography 533. If the candidates do not have a course in Statistics, they should also include an introductory course in this field. The program is designed for students who wish to apply a knowledge of Meteorology to some allied field. Prospective candidates should write and inquire of the Department stating their interests and their background.

(4) A second program leading to an M.Sc. (Meteorology) degree, given with the co-operation of the Atmospheric Environment Services, Environment Canada, requires twenty months of study. To be admitted to this program a student must have an Honors degree in Mathematics or Physics, or its equivalent. The first academic year will include Meteorology 406, 402, 412, 511, 512, 515, 516, 517 and Geography 533. Appropriate courses from other departments may be substituted in some instances with the consent of the Department. Normally a student will take Meteorology 507, 525 and 526 and prepare a thesis in the second year. There will be no language requirement for this degree.

(5) Programs leading to the Ph.D. degree concentrate on those fields of interest in which the Division of Meteorology has the competence to guide the student.

204.54.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

METEO 406. *Meteorological Thermodynamics and Radiation.* ★3 (First Term, 3-0-0). Principles of thermodynamics, thermodynamics of dry and moist air, thermodynamic diagrams, hydrostatic stability, convection, principles of radiation, solar and terrestrial radiation. Prerequisite or corequisite: MATH 302 and MATH 303 or equivalent.

METEO 407. *Introduction to Atmospheric Dynamics.* ★3 (Second Term, 3-0-0). Kinematics of the atmosphere, equations of motion and their simplification, pressure changes, atmospheric interfaces, circulation and vorticity, pressure coordinates, introduction to turbulence. Prerequisite or corequisite: MATH 302 and MATH 303 or equivalent.

METEO 412. *Synoptic Meteorology Laboratory I.* ★3 (First Term, 1-0-3). An introduction of synoptic analysis. Meteorological codes, sea-level map analysis of isobars, air-masses and fronts, stability, constant pressure chart contour and isotherm analysis, cross-sections, differential analysis, thickness charts and thermal winds.

204.54.3 GRADUATE COURSES

THES 000. *Thesis.*

METEO 506. *Reading and Seminar Course in Meteorology.* ★3 (either term, 3-0-0).

METEO 507. *Seminar Course in Meteorology.* ★6 (1-1s-0).

METEO 511. *Synoptic Meteorology.* ★6 (3-0-0). Structure of the atmosphere. The structure and behavior of weather systems. Planetary scale motion systems. Jet streams. Vertical motion. Condensation phenomena. Meso-scale phenomena.

METEO 512. *Synoptic Meteorology Laboratory II.* ★3 (Second Term, 1-0-3). Complementary to Meteorology 511 and 525. Advanced synoptic analysis and an introduction to computer methods. Isogone and streamline analysis, frontal contour, vorticity charts, objective analysis, quantitative precipitation forecasting, and barotropic and baroclinic 500-mb prognostic charts.

METEO 515. *Meteorological Statistics.* ★3 (Second Term, 3-0-0).

METEO 516. *Physical Meteorology.* ★3 (First Term, 3-0-0) Introduction to radiation as the fundamental mechanism for heating and cooling the earth's atmosphere. The transfer of solar and long-wave electromagnetic radiation. Radar meteorology. The role of ozone in the stratosphere.

METEO 517. *Cloud Physics.* ★3 (Second Term, 3-0-0) Condensation of water vapor in the atmosphere, condensation nuclei, growth of droplets from the vapor, statistical growth of drops by collection, ice nuclei, ice formation, snow crystals, growth of hail, numerical modelling of cumulus clouds and precipitation, artificial modification of clouds.

METEO 525. *Atmospheric Turbulence and Diffusion.* ★3 (First Term, 3-0-0). Viscosity, Navier-Stokes Equations. Reynolds stresses. Kolmogorov hypothesis. Monin-Obukhov similarity theory. Plume rise. Atmospheric transport and diffusion of mass. Numerical boundary-layer modelling.

METEO 526. *Advanced Topics in Dynamic Meteorology.* ★3 (Second Term, 3-0-0). Planetary fluid dynamics emphasizing waves in the atmosphere. Principles of numerical weather prediction.

204.55 Microbiology

204.55.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Microbiology offers programs leading to the Master of Science and Doctor of Philosophy degrees.

(2) Research in the Department is currently being conducted in such areas as enzyme purification and

kinetics, enzyme synthesis and regulatory mechanisms, biosynthesis of vitamins and antibiotics, viral and bacterial ultra-structure, virus replication, immunology and immunochemistry, bacterial transport systems, structure and synthesis of macromolecules and microbial ecology.

(3) Students may enter the graduate program with degrees in Biochemistry, Chemistry, Genetics, Pharmacy, or Agriculture, but will be required to take courses to complete their background wherever deficiencies exist. A comprehensive examination may be required of all graduate students 9 to 12 months after entering their program.

(4) Courses offered by the Department of Microbiology will be augmented with those from other departments (for example, Biochemistry, Chemistry, and Genetics, etc.) to develop a graduate program appropriate to each applicant's interest and background.

(5) Graduate Assistantships, as well as financial assistance from research grants to faculty members, are available for most qualified candidates.

(6) Further information is available through inquiry to the Chairman of the Department.

204.55.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

MICRB 401. *Immunology.* ★3 (Second Term, 3-0-0).

MICRB 405. *Immunology Laboratory.* ★3 (Second Term, 0-0-3).

MICRB 411. *Microbial Physiology.* ★3 (First Term, 3-0-0). The structure, growth, and metabolic pathways used by bacteria, yeasts, and molds. Emphasis is placed on the comparative biochemical aspects of microbial life. Prerequisites: MICRB 315, 365, BIOCH 300 or consent of the Department.

MICRB 413. *Microbial Physiology Laboratory.* ★3 (First Term, 0-6L-0). Laboratory exercises introduce the microanalytical techniques used for measuring microbial growth and for following metabolic events at the cellular and subcellular level. Prerequisite, corequisite: MICRB 411.

MICRB 424. *Animal Virology.* ★3 (First Term, 3-0-3).

MICRB 432. *Microbial Metabolism.* ★3 (Second Term, 3-0-0).

MICRB 444. *Microbial Laboratory Techniques.* ★6 (Second Term, 1-0-9).

204.55.3 GRADUATE COURSES

THES 000. *Thesis.*

NOTE: Not all graduate courses are given each year.

INT D 505. *Intermediary Metabolism.* ★3 (First Term, 3-0-0). A detailed description of enzymatic reactions in biosynthetic pathways of carbohydrate, amino acid, vitamin and coenzyme metabolism, emphasizing inter-relationships among metabolic pathways, and stressing relationships between metabolic pathways and growth and function of microbial and animal cells. Prerequisite: BIOCH 300 or equivalent. Offered in alternate years.

MICRB 506. *Cellular Control Mechanisms.* ★3 (Second Term, 0-0-6). The design and operation of laboratory procedures employed to generate current concepts in research. Note: Students require a comprehension of metabolic processes equivalent to INT D 505.

MICRB 507. *Graduate Seminar.* ★6 (0-3s-0). Required each year of all graduate students. Credit will be given when a satisfactory standard is attained.

MICRB 508. *Recent Developments in Virology.* ★3 (either term, 3-0-0).

MICRB 510. *Structure of Micro-organisms.* ★3 (Second Term, 3-0-3).

MICRB 515. *Biosynthesis of Microbial Metabolites.* ★3 (Second Term, 3-0-0). Microbial production of organic acids, antibiotics, vitamins, enzymes, and steriods. Emphasis will be placed on control and regulation of metabolic pathways involved in the formation of these microbial products. Prerequisites: MICRB 315, 365, BIOCH 300 or equivalent.

204.56 Mineral Engineering
(Metallurgy, Mining and Petroleum)

204.56.1 THE DEGREES OF M.ENG., M.SC., AND PH.D.

(1) The Department of Mineral Engineering offers postgraduate courses and provides research facilities to students who wish to pursue advanced studies leading to the degrees M.Eng., M.Sc., Ph.D. in Metallurgical Engineering, Mineral Engineering and Petroleum Engineering; M.Sc., Ph.D. in Metallurgy; M.Eng., M.Sc. in Mining Engineering; M.Eng. Metallurgical Engineering (Welding); and M. Eng. Mineral Engineering (Oil Sands).

(2) Graduates in Engineering or the basic Sciences are eligible to apply for registration in these programs.

(3) Active research areas in the Department include Mineral Processing, Hydrometallurgy, Pyrometallurgy, High Temperature Electrochemistry, Corrosion, Physical and Mechanical Metallurgy, Arc Welding Process and Welding Metallurgy, Mining, Properties of Coal, Coal Gasification, Liquefaction, Flow Through Porous Media, Petroleum Reservoir Behavior and Secondary Recovery.

(4) In the Ph.D. program, before students take their candidacy examination, they shall satisfy their committee that they possess knowledge of one of French, German, or Russian sufficient for the reading of publications in this language.

(5) Graduates in Engineering are eligible to apply for registration in the Master of Engineering programs. Master of Engineering programs normally consist of ten single-term courses plus a project which will take at least one full month to complete. A candidate may complete a Master of Engineering program in a minimum of nine months. The minimum residence required is one term for a B.Sc. graduate with at least one year of post-B.Sc. experience and one session for a B.Sc. graduate with less than one year of post-B.Sc. experience. The maximum time permitted for completion of a Master of Engineering program is five years from the date of first registration.

(6) Financial assistance can be arranged in the form of Graduate Assistantships, or scholarships as listed in the Awards section of the Calendar.

204.56.2 GRADUATE COURSES

THES 000. *Thesis.*

MET E 601. *Research Techniques in Metallurgy.* □3.5 (either term, 2-0-3). Statistical analysis, electron diffraction, crystal growth, diffuse scattering of x-rays, electron emission, high speed strain measurements, internal friction and radioactive tracers. Zone refining, high pressure, and vacuum processes. (★3.)

MET E 610. *Welding Metallurgy.* □3.0 (Second Term, 3-0-0). Heat flow. Effect of welding thermal cycles on weld joints. Weld metal solidification. Metallurgical changes during solidification. Heat-affected zones. Residual stresses and distortion. Ferrous alloy metallurgy. Non-ferrous alloy metallurgy. Dissimilar metal joints. Metallurgy of brazing and soldering. Prerequisite: MNL E 450 or equivalent. (★3.)

MET E 611. *Welding Processes.* □3.8 (First Term, 3-0-3/2). Process classification and selection. Welding heat sources. Heat transfer, metal transfer, gas-metal and slag-metal reactions. Power source characteristics. Analysis of industrial arc welding processes. Cutting processes. Surfacing and metal spraying. Resistance welding. Solid phase bonding. Brazing and soldering. Welding of plastics. Adhesive bonding. Prerequisite: Consent of Department. (★3.)

MET E 615. *Quality Control of Weldments.* □3.8 (either term, 3-0-3/2). Quality assurance systems. Data processing. Welding testing. Prerequisite: Consent of Department. (★3.)

MET E 630. *Special Topics in Process Metallurgy.* ☐3.0 (either term, 3-0-0). Topics of current interest related to mineral processing and process metallurgy such as mathematical modelling, high temperature oxidation, iron and steel making, ionic melts, and production of nonmetallic minerals. (★3.)

MET E 640. *Special Topics in Metallurgical Thermodynamics and Kinetics.* ☐3.0 (either term, 3-0-0). Heterogeneous reactions involving mass transport by diffusion or vapor phase chemical reactions, solid state reactions, and formation of non-equilibrium phases and other subjects of current interest. Prerequisite: MNL E 440 or consent of the Department. (★3.)

MET E 645. *Electrochemical Processes.* ☐3.0 (either term, 3-0-0). Aqueous, molten and solid electrolytes — thermodynamics, structure, Debye-Hückel theory, conduction, diffusion, mobility, transport numbers. Applications of conductivity measurements. Electrodes — types, reactions, potential. Liquid junction potential, electrochemical cells. Applications of emf measurements in chemistry and metallurgy. Electrical double layer, electrode kinetics, overpotential. Chlor-alkali industry, electrometallurgy, electrolysis of water, electroplating. Electrochemical energy conversion — primary and secondary batteries, fuel cells. High temperature applications. Prerequisite: MNL E 530 or consent of the instructor. (★3.)

MET E 650. *Corrosion.* ☐3.0 (either term, 3-0-0). Advanced treatment of a specialized topic in the area of corrosion and oxidation. The subjects to be treated include high-temperature oxidation, stress corrosion, advanced electrochemical corrosion theory, and soil corrosion. Prerequisite: MNL E 545 or consent of the Department. (★3.)

MET E 660. *Metallurgical Applications of X-rays.* ☐3.0 (either term, 3-0-0). Production and detection of x-rays; x-ray fluorescence spectroscopy; electron probe microanalysis; interaction of x-rays with crystals; reciprocal lattice construction; single crystal diffraction patterns; powder diffractometry and measurement of preferred orientations, stress, particle size, etc.; x-ray absorption microscopy; x-ray diffraction microscopy. Prerequisite: MNL E 457 or consent of the Department. (★3.)

MET E 661. *Metallurgical Application of the Electron Microscope.* ☐3.0 (either term, 3-0-0). The design of the electron microscope; electromagnetic lenses; electron diffraction; kinematical and dynamical theories of image contrast; applications to crystals containing dislocations, precipitates and other defects; fractography; scanning electron microscopy. Prerequisite: MNL E 557 or consent of the Department. (★3.)

MET E 662. *Fracture of Metals.* ☐3.0 (either term, 3-0-0). Theoretical strength of solids, Griffith crack theory, mechanisms of brittle and ductile fracture, the ductile to brittle transition, fatigue and creep fracture, environmental effects on fracture. Prerequisite: MNL E 450 or MNL E 557 or consent of the Department. (★3.)

MET E 669. *Theory of Alloy Phases.* ☐3.0 (either term, 3-0-0). Application of thermodynamics, zone theory, and other pertinent concepts to the study of the nature and formation of solid solutions and intermediate phases. Systematic analysis of the variables which are active in alloy formation. Correlation of the nature of the bonding, the crystal structure, and the physical properties. Prerequisite: MNL E 457. (★3.)

MET E 675. *Crystal Lattice Imperfections and the Mechanical Behavior of Solids.* ☐3.0 (Second Term, 3-0-0). Point, line, plane, and volume defects in crystalline materials. Properties of defects. Kinetics of formation, migration, and annihilation of defects. Surfaces and grain boundaries. Anelasticity, internal friction, creep, radiation damage. Prerequisite: MNL E 557 or consent of the instructor. (★3.)

MET E 676. *Special Topics in Physical Metallurgy.* ☐3.0 (either term, 3-0-0). Subjects of current interest such as kinetics of heterogeneous nucleation and phase transformations in solids, grain boundary phenomena, internal friction, physics and chemistry of friction and wear. (★3.)

MET E 680. *Ceramics.* ☐3.0 (either term, 3-0-0). Important ceramic materials and products, processing, typical properties. Structure — binary and ternary compounds, crystalline silicates, glass. Point defects, nonstoichiometry, defect reactions, dislocations. Diffusion, electrochemical transport, examples. Thermal and mechanical properties, thermal shock resistance, electrical conduction. Applications — solid electrolytes, refractories, electronics, energy conversion systems. Prerequisites: MNL E 432 and 457 or consent of the instructor. (★3.)

MET E 900. *Non-Thesis Project.* ☐3.0 (variable). Detailed engineering report in the student's major area of interest. (★3.)

MIN E 602. *Design Project I.* ☐3.0 (First Term, 3-0-0). Design of a mining operation and layout. (★3.)

MIN E 603. *Design Project II.* ☐3.0 (Second Term, 3-0-0). Continuation and extension of MIN E 602. (★3.)

MIN E 620. *Rock Mechanics.* ☐3.0 (either term, 3-0-0). An advanced treatment of selected topics in Rock Mechanics. (★3.)

MIN E 621. *Geomechanics of Underground Mining.* ☐3.0 (either term, 3-0-0). Mechanical behavior of rock masses in the underground environment: in situ stresses; design approaches including numerical methods; shafts; artificial supports; pillars; longwall, sub-level and other caving methods; rock burst control; groundwater; displacement and stress monitoring; design case histories. (★3.)

MIN E 622. *Surface Mining.* ☐3.0 (Second Term, 3-0-0). Preliminary studies; long and short range planning of surface mines including pit designs; equipment selection and control of operations; optimization of financial returns; land conservation and reclamation. Prerequisites: MNL E 424, 512 and 515, or consent of instructor. (★3.)

MIN E 650. *Special Topics in Mining Engineering.* ☐3.0 (either term, 3-0-0). Special studies of developments of current interest within the mining industry in exploration, mining methods, mine planning, mine simulation, environment, regulations, economics and management; e.g., tar sands mining, ocean mining, in situ gasification. (★3.)

MIN E 900. *Non-Thesis Project.* ☐3.0 (variable). An engineering project course for students registered in a Master of Engineering program. (★3.)

MNL E 623. *Oil Sands and Energy Resources Geomechanics.* ☐3.0 (Second Term, 3-0-0). The geomechanics of the three major oil sand development strategies (open pit, *in situ* and hybrid techniques) are presented and analyzed. Implementation of technology involving fluid injection and thermal effects on ground behavior is presented. Hydraulic fracture geomechanics, earth science data and properties required for analysis, equipment requirements, and personnel and structure safety are presented. Prerequisite: CIV E 480 or MNL E 423. (★3.)

MNL E 630. *Advanced Topics in Coal Preparation.* ☐3.0 (either term, 3-0-0). Advanced topics in coal preparation including the mathematical representation of the washability properties of coal, modelling of unit operations used in coal preparation circuit analysis and optimization. Coal preparation economics. Prerequisite: MNL E 431. (★3.)

MNL E 635. *Coal Conversion and Utilization.* ☐3.0 (Second Term, 3-0-0). Coal processing with emphasis on carbonization, gasification, liquefaction and selected aspects of combustion and pollution abatement techniques. Prerequisite: MNL E 535. (★3.)

MNL E 900. *Non-Thesis Project.* ☐3.0 (variable). An engineering project course for students registered in a Master of Engineering program. (★3.)

PET E 612. *Porous Media.* ☐3.0 (First Term, 3-0-0). Physical properties of porous media with emphasis on transport phenomena in porous media; geometrical and mechanical properties, single flow phase fluid flow and (miscible and immiscible) multiphase fluid flow through porous media; and heat transfer in porous media. (★3.)

PET E 614. *Well-Logging and Formation Evaluation.* ☐3. (Second Term, 3-0-0). Petrophysics and modern well-logging methods; discussion of the physical properties of porous media and the measurement of geometric and mechanical properties of the porous media, fluid saturations, chemical composition of the saturating fluids; application of the results in formulation and reservoir evaluation. (★3.)

PET E 630. *Petroleum Reservoir Engineering.* ☐3.0 (First Term 3-0-0). Characteristics of reservoir materials (rock, reservoir fluids); reservoir evaluation (volumetric method, material balance method with water influx), fundamental production processes (primary recovery). (★3.)

PET E 632. *Advanced Topics in Petroleum Production Mechanics.* ☐3.0 (Second Term, 3-0-0). Concepts of reservoir engineering from an advanced point of view as applied to forecasting the performance of oil and/or gas reservoirs; combined driving mechanisms; applications to practical problems encountered during performance by primary means. (★3.)

PET E 634. *Secondary Recovery.* ☐3.0 (Second Term, 3-0-0). Evaluation and operation of secondary recovery projects; fu

damental consideration of petroleum engineering and reservoir behavior applied to secondary recovery of oil; recent technical papers. (★3.)

PET E 635. *Numerical and Analytical Solution of Porous Media Flow Problems.* □3.0 (First Term, 3-0-0). The goal of this course is to develop the techniques for the solution of a wide variety of single phase flow problems in porous media for compressible and incompressible flow. Two dimensional flow will be considered for the greater part. Selected mathematical techniques — analytical as well as numerical — will be developed for specific problems. In a number of cases, analytical and numerical solutions will be compared. (★3.)

PET E 644. *Fluid Mechanics of Natural Gas Production.* □3.0 (First Term, 3-0-0). Single and multiphase flow in circular conduits; steady and transient single phase flow in porous media. (★3.)

PET E 650. *Reservoir Simulator Development.* ★3.0 (Second Term, 3-0-0). The principal objective of this course is the development of reservoir simulation theory to the level required for the construction of a three-phase, three dimensional reservoir simulator. In addition to providing practice in developing a simulator, the course will also cover recent advances in simulation and history matching.

PET E 682. *Graduate Seminar.* □0.5 (0-1s-0). Discussion of progress and problems in research underway in the Department. (★1.)

PET E 684. *Oil and Gas Property Evaluation.* □3.0 (Second Term, 3-0-0). Economics structure of petroleum industry; factors influencing oil economics; the value of money; taxation of oil and gas properties and income; engineering analysis; application of data in the analysis; estimation of costs; evaluation of processing facilities; analysis of profitability; the evaluation report. (★3.)

PET E 694. *Advanced Topics in Petroleum Engineering.* □3.0 (either term, 3-0-0). An advanced treatment of selected petroleum engineering topics of current interest to staff and students. (★3.)

PET E 900. *Non-Thesis Project.* □3.0 (approximately 3 weeks at end of term). An engineering project course for students registered in a Master of Engineering program. (★3.)

204.56.3 READING COURSES

MET E 638. *Process Metallurgy.* □3.0 (either term, 3-0-0). (★3.)

MET E 678. *Physical Metallurgy.* □3.0 (either term, 3-0-0). (★3.)

MIN E 610. *Mining.* □3.0 (either term, 3-0-0). Readings and discussion of selected topics in mining engineering. (★3.)

PET E 732. *Reservoir Engineering.* □3.0 (either term, 3-0-0). (★3.)

PET E 734. *Secondary Recovery.* □3.0 (either term, 3-0-0). (★3.)

PET E 744. *Natural Gas Engineering.* □3.0 (either term, 3-0-0). (★3.)

204.57 Music

204.57.1 THE DEGREES OF M.MUS. AND D.MUS.

(1) The Department of Music offers programs leading to the degrees of Master of Music and Doctor of Music.

(2) Areas of concentration within the M.Mus. program include: Applied Music (keyboard instruments, orchestral instruments, and voice); Composition; Musicology; Music Theory. The entrance requirement is a B.Mus. degree or equivalent. In the case of the M.Mus. (Musicology) an Honors B.A. is also acceptable. Placement tests in Music History (all periods) and Music Theory (tonal and chromatic harmony, 2 and 3 part counterpoint, and aural skills) will be given to entering graduate students. The results of these tests may lead to program requirements in addition to those set forth below.

(3) All Master of Music candidates in Music Theory and Musicology are required to pass a reading test in French, German, or another language other than English, appropriate to the area of research. This requirement must be completed before the thesis is undertaken.

(4) The M.Mus. program in Applied Music will include private instruction in the major instrument, class instruction in ensemble, and one and one-half music options. A course in Bibliography and Methods of Research is required as preparatory to the writing of an essay on a subject closely allied to the applied-music major. Performance requirements include a recital and when recommended by the Department, a solo performance with orchestra. Specializations for keyboard performers in chamber music, pedagogy, vocal accompanying/coaching and solo performance may be arranged with the Department.

(5) The M.Mus program in Composition will include courses in Analysis of 20th Century Music, Pedagogy of Theory, Composition, an option, and Bibliography and Methods of Research. A thesis in the form of a major composition is required. A group of compositions by the candidate is to be presented in a public recital during the candidate's period of residence. The candidate should participate in the program as performer or conductor.

(6) The M.Mus program in Music Theory will include courses in Analysis of 20th Century Music, Pedagogy of Theory, one and one-half options and a thesis. A course in Bibliography and Methods of Research is required as preparatory to the writing of a thesis. The thesis will be an intensive investigation of a specific area or problem in music theory.

(7) The M.Mus. program in Musicology will include four graduate courses to be chosen from the areas of General History, Music Theory and/or Music History. An additional course in Bibliography and Methods of Research will be required if not included in the undergraduate degree. A thesis in an historical or theoretical area is required in addition to course work.

(8) The D.Mus. program is offered only in Performance (piano, organ, violin, viola and cello). The entrance requirement is a M.Mus. degree or equivalent and evidence of outstanding ability and accomplishment in the area of concentration. Placement examinations will be required of graduates of other institutions and for University of Alberta graduates who have held their Master's degrees for more than two years prior to application.

(9) D.Mus. candidates will be required to demonstrate reading proficiency in one approved language other than English before being admitted to candidacy.

(10) Courses of study for D.Mus. students will be formulated by the Department according to individual need.

(11) The D.Mus. candidacy examination will be in two parts, written and oral, and will cover such areas as Music History, Analysis, Harmony, Counterpoint, and the Literature of a Major Instrument. The examination should normally be taken near the end of the student's second year as a provisional candidate and must be successfully completed before the third required public performance. The oral part of the examination must take place not later than one month after successful completion of the written part of the examination. If the student fails the examination, all or a portion of it may be repeated once within one year of the first attempt at the discretion of the Committee.

(12) In lieu of a formal dissertation D.Mus. candidates will write a scholarly essay and present at least four public performances including a solo recital, a lec-

ture recital, a second solo or lecture recital, and a chamber music recital or solo performance with orchestra.

(13) The final examination for the D.Mus. degree will include a defence of essay and performances.

(14) Graduate students in music are eligible to compete for the general graduate awards listed in § 224.2 of the Awards Calendar, and are encouraged to do so. Inquiries should be directed to the Administrator of Student Awards. Graduate assistantships are available within the department, and inquiries should be addressed to the Chairman of the Department.

(15) Application forms and calendars can be obtained from the Dean of Graduate Studies and Research. Applications must be received by April 1. For further information, write directly to the Chairman, Department of Music.

204.57.2 UNDERGRADUATE COURSES

The following courses may be taken for graduate credit:

MUSIC 400. *History of Opera.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402 or equivalent.

MUSIC 401. *History of the Symphony.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402 or equivalent.

MUSIC 403. *Piano Pedagogy I.* ★3 (First Term, 2-0-1). Prerequisite: Consent of the Department.

MUSIC 404. *Piano Pedagogy II.* ★3 (Second Term, 2-0-1). Prerequisite: MUSIC 403.

MUSIC 406. *Liturgics and Service Improvisation.* ★6 (1-0-2). Prerequisites: MUSIC 324 or 325 (organ) and consent of Department.

MUSIC 407. *History of the Concerto.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402 or equivalent.

MUSIC 408. *History of Chamber Music.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402 or equivalent.

MUSIC 410. *Studies in Musical Style I.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402.

MUSIC 411. *Studies in Musical Style II.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304 and 402.

MUSIC 415. *Introduction to Conducting.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 250 and 251 or equivalents.

MUSIC 416. *Instrumental Conducting.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 415.

MUSIC 417. *Choral Conducting.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 415.

MUSIC 418. *Choral Literature I.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 250 and 251, and any one of the following: MUSIC 202, 203, 301, 304, 402, or equivalents.

MUSIC 419. *Choral Literature II.* ★3 (Second Term, 3-0-0). Prerequisites: MUSIC 250 and 251, and any of the following: MUSIC 202, 203, 301, 304, 402, or equivalents.

MUSIC 426. *Piano Improvisation.* ★3 (either term, 0-3L-0). Prerequisites: MUSIC 350, 351 and consent of the instructor.

MUSIC 427. *Continuo Realisation.* ★3 (either term, 0-3L-0). Prerequisites: MUSIC 350, 351, and consent of the instructor.

MUSIC 428. *Art Song Interpretation.* ★3 (0-2L-0). Prerequisite: MUSIC 324 or 325 or equivalent and consent of the Department. Note: A single-term course offered over the full session.

MUSIC 432. *Music of the Great Liturgies.* ★6 (3-0-0).

MUSIC 435. *Vocal Literature I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department for other than B.Mus. students.

MUSIC 436. *Vocal Literature II.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 324, 325 or equivalent.

MUSIC 437. *Sxiteenth Century Counterpoint.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 202 and 350. Note: Formerly part of MUSIC 433.

MUSIC 438. *Introduction to Medieval and Renaissance Music Theory.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 437. Note: Formerly part of MUSIC 433.

MUSIC 455. *Opera Workshop I.* ★3 (First Term, 3-0-5). Prerequisite: MUSIC 324 or 325 or equivalent.

MUSIC 456. *Opera Workshop II.* ★3 (Second Term, 3-0-5). Prerequisite: MUSIC 455 or consent of the Department.

MUSIC 457. *String Literature I.* ★3 (First Term, 3-0-0). Prerequisite: One of MUSIC 203, 301 or 304, or equivalent.

MUSIC 458. *String Pedagogy I.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 323 or 324, or equivalent.

MUSIC 462. *Fundamentals of Orchestration and Arranging.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 350 and 351 or equivalent.

MUSIC 463. *Orchestration.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 462.

MUSIC 501. *Music History Seminar I.* ★3 (First Term, 0-3s-0). Prerequisites: MUSIC 202, 203, 301, 304 and 402 or equivalent.

MUSIC 502. *Music History Seminar II.* ★3 (Second Term, 0-3s-0). Prerequisite: MUSIC 202, 203, 301, 304 and 402 or equivalent.

MUSIC 503. *Piano Literature I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 504. *Piano Literature II.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 505. *Bibliography and Methods of Research I.* ★3 (First Term, 3-0-0).

MUSIC 506. *Tutorial Study.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304 and 402.

MUSIC 507. *Bibliography and Methods of Research II.* ★3 (Second Term, 3-0-0). Prerequisite: MUSIC 505.

MUSIC 508. *Seminar in Canadian Music.* ★3 (either term, 3-0-0).

MUSIC 510. *Notation of Medieval Music.* ★3 (First Term, 0-3L-0). Prerequisite: MUSIC 202.

MUSIC 520. *Notation of Renaissance Music.* ★3 (Second Term, 0-3L-0). Prerequisite: MUSIC 202.

MUSIC 528. *Art Song Interpretation.* ★3 (0-2L-0). Prerequisite: MUSIC 424 or 425 or 465 and 428 or equivalent and consent of the Department.

MUSIC 529. *Ensemble.* ★3 (0-2L-0). Note: A single-term course offered over the full session. Prerequisite: Consent of the Department based upon audition for other than B.Mus. students.

MUSIC 531. *History of Organ Building and Design.* ★3 (either term, 3-0-0). Prerequisites: Any two of MUSIC 202, 203, 301, 304, 402 or equivalent.

MUSIC 532. *Music in the Church.* ★3 (either term, 3-0-0). Prerequisites: MUSIC 202, 203, 301, 304, and 402 or equivalents.

MUSIC 533. *Organ and Harpsichord Literature to c. 1750.* ★3 (First Term, 3-0-0). Prerequisites: MUSIC 202 and 203 or equivalent.

MUSIC 534. *Organ Literature c. 1750 - present.* ★3 (Second Term, 3-0-0). Prerequisites: Any *two* of MUSIC 301, 304, 402 or equivalents.

MUSIC 535. *Vocal Pedagogy I.* ★3 (First Term, 3-0-0) Prerequisite: Consent of the Department for other than B.Mus students.

MUSIC 536. *Vocal Pedagogy II.* ★3 (Second Term, 3-0-0) Prerequisite: MUSIC 535.

MUSIC 543. *Pedagogy of Theory.* ★6 (3-0-0). Prerequisite: MUSIC 350, 351 and 352 or equivalents.

MUSIC 544. *Advanced Harmony.* ★3 (either term, 3-0-0) Prerequisite: MUSIC 350.

MUSIC 545. *Eighteenth Century Fugue.* ★3 (either term, 3-0-0) Prerequisite: MUSIC 352.

MUSIC 555. *Opera Workshop III.* ★3 (First Term, 3-0-5) Prerequisite: MUSIC 456 or consent of the Department.

MUSIC 556. *Opera Workshop IV.* ★3 (Second Term, 3-0-5) Prerequisite: MUSIC 555 or consent of the Department.

MUSIC 557. *String Literature II.* ★3 (First Term, 3-0-0) Prerequisite: *One* of MUSIC 203, 301, 304 or equivalents.

MUSIC 558. *String Pedagogy II.* ★3 (Second Term, 3-0-0) Prerequisites: MUSIC 323, 324 or equivalents.

MUSIC 560. *Composition.* ★6 (3-0-0). A sequent course to MUSIC 460 with emphasis on the study of, and writing for larger groups of voices and instruments. Note: Public performance of works completed in the course will be expected.

MUSIC 561. *Orchestration.* ★6 (3-0-0). Prerequisite: MUSIC 463.

MUSIC 570. *Aural Theory.* ★3 (0-2L-0). Prerequisite: MUSIC 351 or equivalent.

MUSIC 571. *Score Reading and Orchestra Literature.* ★3 (0-2L-0). Prerequisites: MUSIC 305, 351 and 425 or equivalents.

MUSIC 580. *Twentieth-Century Compositional Techniques.* ★3 (First Term, 3-0-0). Prerequisite: MUSIC 350 or consent of the Department.

MUSIC 581. *Trends in Avant-Garde Music.* ★3 (Second Term, 3-0-0). Includes studies in electronic music. Prerequisite: MUSIC 580 or consent of the Department.

MUSIC 590. *Music Criticism I.* ★3 (First Term, 3-0-0). Prerequisite: Consent of the Department.

MUSIC 591. *Music Criticism II.* ★3 (either term, 3-0-0). Prerequisite: MUSIC 590.

204.57.3 GRADUATE COURSES

THES 000. *Thesis.*

MUSIC 605. *Seminar in American Music.* ★3 (either term, 0-3s-0).

MUSIC 606. *Seminar in Baroque Music.* ★3 (either term, 0-3s-0).

MUSIC 607. *Seminar in Classical Music.* ★3 (either term, 0-3s-0).

MUSIC 608. *Seminar in Twentieth-Century Music.* ★3 (either term, 0-3s-0).

MUSIC 612. *Collegium Musicum.* ★3 (0-2L-0).

MUSIC 615. *Seminar in Music History and Literature I.* ★3 (First Term, 0-3s-0).

MUSIC 616. *Seminar in Music History and Literature II.* ★3 (Second Term, 0-3s-0). Prerequisite: MUSIC 615.

MUSIC 623. *First Practical Subject — Orchestral Instruments.* ★6 (2-0-3).

MUSIC 625. *First Practical Subject — Keyboard or Voice.* ★6 (2-0-0).

MUSIC 628. *Art Song Interpretation.* ★3 (0-2L-0). Note: A single-term course offered over the full session. Prerequisites: MUSIC 525 or 565, and 528 or equivalent, and consent of the Department.

MUSIC 629. *Ensemble.* ★3 (0-2L-0). Note: A single-term course offered over the full session.

MUSIC 650. *Analysis of Twentieth-Century Music.* ★6 (3-0-0).

MUSIC 655. *Dramatic Coaching in Opera.* ★3 (0-3L-0).

MUSIC 660. *Composition.* ★6 (3-0-0).

MUSIC 673. *Special Projects in String Performance.* ★6 (2-0-3). Note: Restricted to Doctor of Music students.

MUSIC 675. *Special Projects in Keyboard Music.* ★6 (2-0-0). Note: Restricted to Doctor of Music students.

MUSIC 679. *Special Projects in Chamber Music.* ★3 (0-2L-0). Note: A single term course offered over the full session. Restricted to Doctor of Music students.

MUSIC 683. *Seminar in Keyboard Literature I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 684. *Seminar in Keyboard Literature II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 687. *Seminar in Literature of Stringed Instruments I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 688. *Seminar in Literature of Stringed Instruments II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 690. *Composition in Traditional Styles.* ★3 (either term, 3-0-0). Note: Restricted to Doctor of Music students.

MUSIC 691. *Composition in Contemporary Styles.* ★3 (either term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 692. *Seminar in Musical Analysis I.* ★3 (First Term, 0-3s-0). Note: Restricted to Doctor of Music students.

MUSIC 693. *Seminar in Musical Analysis II.* ★3 (Second Term, 0-3s-0). Note: Restricted to Doctor of Music students.

204.58 Nursing

204.58.1 THE DEGREE OF M.NURS.

(1) The Faculty of Nursing offers a two-year program leading to the degree of Master of Nursing. The primary emphasis is upon preparing nurses to function as advanced clinical practitioners in the care of the acutely ill. However, students are encouraged to pursue a second focus of interest (e.g., administration, teaching, research).

(2) All students are required to complete a thesis.

(3) Students' programs will be substantially tailored to their nursing backgrounds and their future career objectives. Most students undertake the equivalent of four courses each term in their first year, and take two courses per term, plus do a thesis in their second year. The intent in program planning is to assist students to pursue special interests within the Faculty of Nursing and within the University as a whole.

(4) The time required to complete the Master's program varies according to the candidate's undergraduate preparation and career experience, and the nature of the research undertaken. Generally a minimum of two academic years is required.

(5) Information regarding assistantships and other forms of financial assistance will be supplied on request.

(6) General inquiries should be addressed to The Coordinator of Graduate Programs, Faculty of Nursing, Clinical Sciences Building, The University of Alberta, Edmonton, Canada.

204.58.2 PROGRAM OF STUDIES

It is underlined that individual student programs vary. For example, most students take a minimum of two electives in their first year, and these are determined on an individual basis. However, most students take the following "core" courses:

(1) *First Year*

Nursing 500-501 (Theory and Research in Nursing)
Nursing 505-506 (Advanced Clinical Nursing)
H.S.A. 430-431 (Research)

(2) *either year*

Nursing 550 (Advanced Trends)

(3) *Second Year*

H.S.A. 530-531 (or equivalent Advanced Research)
Nursing 560 (Advanced Topics in Acute Illness)
Thesis

204.58.3 ADMISSION REQUIREMENTS

(1) Preference will be given to Alberta residents who have advanced clincial expertise in nursing the acutely ill;

(2) A baccalaureate degree in Nursing with an average of at least 65% in the work of the final two years;

(3) Submission of the results of a Miller Analogies Test;

(4) A statement from the Coordinator of Graduate Programs in the Faculty of Nursing that the applicant is, in all respects, acceptable to the Faculty.

(5) A specified schedule of immunization must be completed prior to commencement of clinical practice in the program.

204.58.4 GRADUATE COURSES

THES 000. *Thesis.*

NURS 500. *Theory and Research in Nursing in Acute Illness I.* ★3 (First Term, 3-0-0). Advanced analysis of theories, processes and research in nursing, with special emphasis upon problem-solving, and the delineation of biological and psycho-social priorities in patient care. Prerequisite: Consent of the instructor.

NURS 501. *Theory and Research in Nursing in Acute Illness II.* ★3 (Second Term, 3-0-0). Advanced problems in nursing acutely ill patients, with special emphasis upon communication and co-ordination with other health and social services, patients'

families, and community resources. Prerequisite: NURS 500 or consent of the instructor.

NURS 505. *Advanced Clinical Nursing I.* ★6 (First Term, 0-2s-6). (The hours cited for this course should be regarded as minimum. Individual students may be required to complete additional clinical practice requirements.) Advanced clinical experience in nursing acutely ill patients with emphasis upon the development of problem-solving skills as they relate to patient care, including comprehensive assessment of patients' nursing care needs. Corequisite: NURS 500.

NURS 506. *Advanced Clinical Nursing II.* ★6 (Second Term, 0-2s-6). (The hours cited for this course should be regarded as minimum. Individual students may be required to complete additional clinical practice requirements.) Advanced clinical experience in meeting the nursing care needs of acutely ill patients, with emphasis upon communication and coordination of care with other health and social services personnel, patients' families, and community resources. Prerequisite: NURS 505; corequisite: NURS 501.

NURS 550. *Advanced Seminar in Trends in Nursing.* ★2 (First Term, 0-3s-0). Advanced analysis of trends, problems and issues in the field of nursing, with emphasis on its interrelationships with other components of the health care system. Prerequisite: Consent of the instructor.

NURS 560. *Advanced Topics in Acute Care Nursing.* ★3 (either term, 3-0-0). A conference course aimed at developing in-depth knowledge regarding a topic/topics directly or indirectly related to advanced level nursing in the area of acute care. Teaching approach varied to suit learning objectives, and may include the use of such methods as tutorials, clinical experiences, and seminars.

H S A 430. *Methods and Statistics in Health Services Administration: I.* ★3 (First Term, 3-0-0).

H S A 431. *Methods and Statistics in Health Services Administration II.* ★3 (Second Term, 3-0-0).

H S A 530. *Statistics for Health Services Administration.* ★3 (First Term, 3-0-0).

H S A 531. *Research Methods in Health Services Administration.* ★3 (Second Term, 3-0-0).

204.59 Ophthalmology

204.59.1 THE DEGREE OF M.SC.

NOT AVAILABLE FOR 1981-82

(1) The Department of Ophthalmology offers the degree of M.Sc. in Experimental Ophthalmology either as part of the four year coordinated residency program leading to fulfilment of graduate training requirements in Ophthalmology of the Royal College of Physicians and Surgeons of Canada, or as a separate program for those proceeding from a B.Sc or equivalent.

(2) Normally an M.D. will be considered as an entrance requirement. For other candidates a qualifying year may be required.

(3) Program requirements include preparation and defence of a thesis based on research performed by the candidate and successful completion of at least one full-session or two single-term graduate courses. Studies in The University of Alberta residency program of the Department may be considered as contributing to the overall requirements. The minimum University residence requirement is a full calendar year of research.

(4) Research may be carried out in basic or applied disciplines related to the epidemiology, clinical investigation or management of patients with ocular abnormalities or in experimental work related to normal ocular function.

(5) Inquiries should be direct to the Chairman of the Department of Ophthalmology, Clinical Sciences Building, The University of Alberta.

204.60 Paediatrics

204.60.1 THE DEGREE OF M.SC. AND PH.D.

(1) Facilities exist within the Department of Paediatrics for students who wish to proceed to the Master of Science Degree.

(2) Inquiries should be directed to the Chairman of the Department of Paediatrics, Room 4-117 Clinical Sciences Building, The University of Alberta.

(3) The Department of Paediatrics is one of six departments working jointly to offer a Ph.D. in Medical Sciences. Preference is given to those with an M.D. Degree who wish to obtain training for a career in clincial research. Highly qualified candidates with an M.D. who wish to proceed to a Ph.D. will be considered.

(4) Inquiries should be directed to the Chairman, Ph.D. (Medical Sciences) Committee, Room 854, Medical Sciences Building, The University of Alberta. (See § 204.51/Medical Sciences).

204.61 Paleontology

Departments of Geology and Zoology

PALEO 418. *Paleontology of the Lower Vertebrates.* ★3 (First Term, 3-0-3).

PALEO 419. *Paleontology of the Higher Vertebrates.* ★3 (Second Term, 3-0-3).

PALEO 514. *Advanced Paleontology.* ★3 (Second Term, 3-0-0). Contemporary aspects of theoretical paleontology, including: functional morphology, adaption and evolution in invertebrate and vertebrate fossils; the distribution of fossils as evidence for continental drift. Prerequisites: GEOL 414 or ZOOL 352/353 or consent of the instructors.

PALEO 620. *Problems in Vertebrate Paleontology.* ★3 (0-1s-0). Prerequisites: PALEO 418 and 419.

NOTE: For further related courses see § 204.36.2.

204.62 Pathology

204.62.1 THE DEGREE OF M.SC.

(1) The Department of Pathology provides a program leading to the degree of Master of Science in Medical Laboratory Science.

(2) Holders of a B.Sc. in Medical Laboratory Science or related scientific subjects, or of an M.D. or its equivalent in Medicine, can enter this program. Prerequisite courses can be specified only at the time when the individual candidate is arranging a program, although some biological sciences, particularly microbiology, biochemistry, and physiology, should have been studied.

(3) The requirements for the degree include course work, seminars, and an approved research project. Holders of a B.Sc. normally require two years, and holders of an M.D. normally require one year, to complete their programs.

(4) Approved courses offered by the Departments of Anatomy, Biochemistry, Physiology, Pharmacology, and Plant Science may be included in the candidate's program. In certain circumstances courses offered by other departments may be approved.

(5) Inquiries should be directed to the Chairman of the Department of Pathology.

204.62.2 GRADUATE COURSES

THES 000. *Thesis.*

NOTE: Not all graduate courses are offered every year. The Chairman of the Department should be consulted regarding the availability of graduate courses in any academic session.

PATH 501. *Cellular and Tissue Structure and General Mechanisms of Disease.* ★6 (0-4s-0).

PATH 502. *Cellular and Tissue Structure and General Mechanisms of Disease.* ★6 (0-4s-0).

PATH 503. *Advanced Haematology.* ★3 (First Term, 3-0-0).

PATH 504. *Seminars in General Pathology.* ★1 (either term, 1-0-0).

PATH 505. *Fundamentals of Histochemistry.* ★2 (First Term, 2-0-0).

PATH 506. *Medical Biochemistry.* ★6 (2-0-0).

PATH 507. *Medical Biochemistry.* ★6 (2-0-0).

PATH 508. *Haematology Special Project.* ★3 (Second Term, 0-0-3).

PATH 509. *Clinical Chemistry Special Project.* ★3 (Second Term, 0-0-3).

PATH 510. *Cryobiology.* ★6 (2-1s-0).

PATH 610. *Subcellular Morphology.* ★2 (Second Term, 2-0-0).

204.63 Pharmacology

204.63.1 THE DEGREE OF M.SC. AND PH.D.

(1) The Department of Pharmacology offers graduate programs leading to the degrees of Master of Science and Doctor of Philosophy in Pharmacology.

(2) The Department offers a wide range of research fields as determined by the interests of the staff. These include problems in the physiological, biochemical and molecular aspects of Pharmacology. Techniques available include electrophysiological recording, radioactive tracers, spectrophotometric assays, photofluorometric assays, isolation of cell fractions and chemical syntheses.

(3) Graduate studies in Pharmacology may be of interest to candidates with degrees in general biology, psychology, physics, chemistry, biochemistry, physiology, bacteriology, pharmacy, medicine and dentistry. Prerequisite courses will be specified at the time of arrangement of the candidate's program.

(4) The time required for completion of graduate programs will vary with previous training of the individual and may be less for those entering with an honors degree or a degree in Medicine or Pharmacy.

(5) Graduate and undergraduate courses offered by other departments may be included in a candidate's program by arrangement between the departments concerned.

(6) Financial support of the candidate may be arranged. Graduate Assistantships are available to a limited number of students.

(7) Inquiries should be directed to the Chairman of the Department of Pharmacology.

204.63.2 ADVANCED STUDY IN PHARMACOLOGY

(1) A special program has been arranged for graduates in Medicine wishing to spend an additional year in a basic science department. This program does not lead to a degree, but may satisfy some of the course requirements should the student wish to proceed to a master's degree.

(2) The program includes graduate courses, a weekly seminar, duties as a class laboratory demonstrator, participation in a research project, and optional attendance at undergraduate lectures.

(3) Those wishing to undertake this program should register as special students in the Faculty of Medicine.

204.63.3 UNDERGRADUATE COURSES

The following may be taken for graduate credit. (Details of the courses are given in the Faculty of Science calendar.)

PMCOL 432. *Pharmacology.* ★6 (3-0-3). Prerequisite: Consent of the Department.

PMCOL 435. *Experimental Procedures in Pharmacology.* ★3 (either term, 0-1s-6). Prerequisite: Consent of the Department.

PMCOL 436. *Analytical Techniques in Pharmacology.* ★3 (either term, 0-0-6). Prerequisite: Consent of the Department.

204.63.4 GRADUATE COURSES

THES 000. *Thesis.*

NOTE: Not all graduate courses are offered every year. The Chairman of the Department should be consulted regarding the prerequisites for and availablity of graduate courses in any academic session.

PMCOL 501. *Pharmacology Tutorial, Research and Reading Course.* ★3 (First Term, 3-0-0).

PMCOL 502. *Pharmacology Tutorial, Research and Reading Course.* ★3 (Second Term, 3-0-0).

PMCOL 508. *Molecular Pharmacology.* ★3 (either term, 3-0-0).

PMCOL 509. *Neuropharmacology.* ★3 (either term, 3-0-0).

PMCOL 510. *Advanced Topics.* ★3 (First Term, 3-0-0).

PMCOL 511. *Advanced Topics.* ★3 (Second Term, 3-0-0).

PMCOL 600. *Seminar in Pharmacology.* ★0 (0-1s-0).

PMCOL 601. *The Actions of Drugs on Membranes.* ★3 (either term, 3-0-0).

PMCOL 602. *Clinical Pharmacology.* ★3 (either term, 2-0-0).

204.64 Pharmacy and Pharmaceutical Sciences

204.64.1 THE DEGREE OF M.SC. AND PH.D.

(1) The Faculty of Pharmacy and Pharmaceutical Sciences offers programs leading to the Master of Science and Doctor of Philosophy degrees and can accommodate a limited number of graduate students in modern well-equipped laboratories.

(2) Research may be undertaken in fields such as Pharmaceutics, Biopharmaceutics, Physical Pharmacy, Bionucleonics, Radiopharmacy, Medicinal Chemistry, Pharmaceutical Chemistry, Drug Analysis, Drug Metabolism, Microbiology, Pharmacology, Hospital Pharmacy, Clinical Pharmacy, Toxicology and Neurochemistry.

(3) Individuals with previous degrees in such fields as Pharmacy, Biology, or Chemistry will be considered.

(4) Financial assistance may be available from the Canadian Foundation for the Advancement of Pharmacy, the Medical Research Council of Canada, the Alberta Heritage Foundation for Medical Reseach, and from other sources.

(5) Prospective candidates should consult with the Dean regarding the requirements.

204.64.2 THE DEGREE OF M.PHARM.

A two year program combining academic course work, professional experience and research investigation leading to the degree of Master of Pharmacy in var-

ious professional areas (e.g., Clinical Pharmacy, Drug Information, Hospital Practice, etc.) is offered to acceptable students holding a B.Sc. degree in Pharmacy. The first academic term is devoted primarily to course work in the biological and health sciences. The professional portion of the program consists of research and study in a professional environment leading to the submission of an acceptable thesis.

204.64.3 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

PMCOL 431. *Pharmacology.* ★6 (3-0-3).

PMCOL 435. *Experimental Procedure in Pharmacology.* ★3 (First Term, 0-1s-6).

PHARM 450. *Introduction to Radiopharmacy.* ★3 (First Term, 3-0-2).

PHARM 454. *Isotopes in Nuclear Medicine.* ★3 (Second Term, 3-0-0).

PHARM 455. *Experiments in Nuclear Medicine.* ★2 (Second Term, 0-1s-2).

PHARM 463. *Pharmaceutical Toxicology I.* ★3 (either term, 3-0-0).

PHARM 464. *Clinical Pharmacy.* ★3 (either term, 2-0-4).

PHARM 473. *Selected Topics in Medicinal Chemistry.* ★3 (Second Term, 3-0-0).

PHARM 484. *Biological Products.* ★3 (First Term, 3-0-0).

PHARM 485. *Analytical Methods for Biological Products.* ★2 (Second Term, 1-0-2).

204.64.4 GRADUATE COURSES

THES 000. *Thesis.*

PHARM 522. *Phytochemistry.* ★3 (First Term, 3-0-0). Offered alternate years.

PHARM 551. *Clinical Radiopharmacy Laboratory.* ★3 (Second Term, 1-0-4).

PHARM 554. *Radiation Biology.* ★3 (either term, 3-0-0).

PHARM 555. *Experiments in Radiation Biology.* ★2 (either term, 0-1s-2).

PHARM 560. *Parenteral Products.* ★3 (Second Term, 2-0-3).

PHARM 561. *Pharmaceutical Technology.* ★3 (First Term, 2-0-3).

PHARM 562. *Hospital Pharmacy.* ★3 (First Term, 2-2s-0).

PHARM 570. *Advanced Pharmaceutical Analysis — Spectroscopy.* ★3 (First Term, 3-0-4). Prerequisite: PHARM 425 or consent of the Faculty.

PHARM 571. *Advanced Pharmaceutical Analysis — Electroanalysis Techniques.* ★3 (Second Term, 3-0-4).

PHARM 572. *Advanced Pharmaceutical Analysis —Analytical Techniques in Forensic Toxicology and Drug Metabolism.* ★3 (Second Term, 3-0-4).

PHARM 586. *Pharmaceutical Toxicology II.* ★3 (Second Term, 3-0-3).

PHARM 601. *Isotope Tracer Methodology I.* ★3 (First Term, 3-0-3).

PHARM 603. *Activation Analysis.* ★2 (Second Term, 2-0-0).

PHARM 604. *Applied Problems in Current Research.* ★3 (either term, 0-0-3).

PHARM 605. *Radiopharmaceutical Chemistry.* ★2 (Second Term, 2-0-0).

PHARM 606. *Current Topics in Bionucleonics and Radiopharmacy.* ★3 (either term, 3-0-0).

PHARM 610. *Advanced Physical Pharmacy.* ★3 (First Term, 3-0-4).

PHARM 611. *Pharmaceutical Formulation and Development.* ★3 (Second Term, 3-0-4).

PHARM 620. *Structure-Action Relationships of Organic Medicinals.* ★3 (First Term, 3-0-0). Offered alternate years.

PHARM 623. *Medicinal Macromolecules.* ★3 (Second Term, 3-0-0). Note: Offered alternate years.

PHARM 624. *Application of Nuclear Magnetic Resonance Spectroscopy to Medicinal and Pharmaceutical Chemistry.* ★3 (First Term, 3-0-0). Offered alternate years.

PHARM 625. *Stereochemical Aspects of Medicinal and Pharmaceutical Chemistry.* ★3 (Second Term, 3-0-0).

PHARM 626. *Applications of Mass Spectrometry to Medicinal and Pharmaceutical Chemistry.* ★3 (Second Term, 3-0-0). Offered alternate years.

PHARM 630. *The Metabolism and Excretion of Drugs.* ★3 (Second Term, 3-0-3). Offered alternate years.

PHARM 664. *Advanced Topics in Clinical Pharmacy.* ★3 (First Term, 1-0-3). Prerequisites: PHARM 464, 487 and 488 or consent of the Faculty.

PHARM 665. *Drug Information.* ★3 (First Term, 1-0-3). Prerequisites: PHARM 412, statistics (STATS 241 or PSYCO 309 or equivalent) or consent of the Faculty.

PHARM 699. *Graduate Seminar.* ★0 (0-1s-0).

204.65 Philosophy

204.65.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department offers programs leading to the Master of Arts and Doctor of Philosophy degrees.

(2) The fields in which advanced study may be pursued include Ethics, Aesthetics, History of Ancient, Medieval and Modern Philosophy, Logic, Philosophy of Science, Epistemology, Philosophy of Language and Philosophy of Mind. Inquiries concerning possible subjects for research should be directed to the Chairman of the Department.

(3) Applicants for a one year M.A. program in Philosophy must have completed training equivalent to that of graduates with honors in Philosophy from this Department. Other applicants for the M.A. degree will normally take two years, the first year of which may be a qualifying year.

(4) Before taking the oral candidacy examination a student in the Ph.D. program must have passed comprehensive examinations in four areas of his/her choice and satisfied the logic requirement. Students whose field of research involves primary-source material in a language other than English shall in addition be required to pass an appropriate language examination.

(5) Graduate students in philosophy are eligible to compete for the general graduate awards listed in § 224.2 below, and are encouraged to do so. Inquiries should be directed to the Administrator of Student Awards. Graduate Assistantships are available within the Department, and inquiries should be addressed to the Chairman of the Department.

204.65.2 GRADUATE COURSES

THES 000. *Thesis.*

NOTE: Only a selection of the courses listed below are offered each year. Information on courses being offered in 1980-81 will be available in April 1980.

PHIL 500. *Topics in Ancient and Medieval Philosophy I.* ★3 (First Term, 3-0-0).

PHIL 501. *Topics in Ancient and Medieval Philosophy II.* ★3 (Second Term, 3-0-0).

PHIL 502. *Plato.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 503. *Topics in Greek Philosophy I.* ★3 (either term, 3-0-0).

PHIL 504. *Aristotle.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 505. *Topics in Greek Philosophy II.* ★3 (either term, 3-0-0).

PHIL 506. *Topics in Medieval Philosophy I.* ★3 (either term, 3-0-0).

PHIL 507. *Topics in Medieval Philosophy II.* ★3 (either term, 3-0-0).

PHIL 508. *Descartes.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 509. *Locke.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 510. *Hegel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 511. *Topics in the History of Modern Philosophy I.* ★3 (either term, 3-0-0).

PHIL 512. *Marx and Marxism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

PHIL 515. *Topics in the History of Modern Philosophy II.* ★3 (either term, 3-0-0).

PHIL 516. *Wittgenstein.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
PHIL 519. *Problems in Philosophy I.* ★3 (either term, 3-0-0).
PHIL 520. *Problems in Philosophy II.* ★3 (either term, 3-0-0).
PHIL 522. *Moral Philosophy.* ★3 (either term, 3-0-0).
PHIL 524. *Social and Political Philosophy I.* ★3 (either term, 3-0-0).
PHIL 525. *Social and Political Philosophy II.* ★3 (either term, 3-0-0).
PHIL 526. *Aesthetics I.* ★3 (either term, 3-0-0).
PHIL 527. *Aesthetics II.* ★3 (either term, 3-0-0).
PHIL 528. *Philosophy of History.* ★3 (either term, 3-0-0).
PHIL 531. *Existentialism.* ★3 (either term, 3-0-0).
PHIL 536. *Phenomenology I.* ★3 (either term, 3-0-0).
PHIL 537. *Phenomenology II.* ★3 (either term, 3-0-0).
PHIL 545. *Metaphysics I.* ★3 (either term, 3-0-0).
PHIL 548. *Conference Course.* ★6 (3-0-0).
PHIL 549. *Conference Course.* ★3 (either term, 3-0-0).
PHIL 552. *Honors Tutorial III.* ★3 (First Term, 3-0-0).
PHIL 553. *Honors Tutorial IV.* ★3 (Second Term, 3-0-0).
PHIL 554. *Theory of Value.* ★3 (either term, 3-0-0).
PHIL 556. *Kant.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
PHIL 557. *Philosophy of Religion I.* ★3 (either term, 3-0-0).
PHIL 558. *Philosophy of Religion II.* ★3 (either term, 3-0-0).
PHIL 559. *Topics in Philosophy of the Social Sciences.* ★3 (either term, 3-0-0).
PHIL 561. *Topics in Logic I.* ★3 (either term, 3-0-0).
PHIL 562. *Topics in Logic II.* ★3 (either term, 3-0-0).
PHIL 563. *Epistemology I.* ★3 (either term, 3-0-0).
PHIL 564. *Philosophy of Science I.* ★3 (either term, 3-0-0).
PHIL 565. *Metaphysics II.* ★3 (either term, 3-0-0).
PHIL 566. *Epistemology II.* ★3 (either term, 3-0-0).
PHIL 567. *Philosophy of Science II.* ★3 (either term, 3-0-0).
PHIL 568. *Philosophy of Mind I.* ★3 (either term, 3-0-0).
PHIL 569. *Philosophy of Mind II.* ★3 (either term, 3-0-0).
PHIL 570. *Philosophy of Language I.* ★3 (either term, 3-0-0).
INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0).
PHIL 571. *Contemporary Topics I.* ★3 (either term, 3-0-0).
INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0).
PHIL 572. *Philosophy of Language II.* ★3 (either term, 3-0-0).
PHIL 573. *Contemporary Topics II.* ★3 (either term, 3-0-0).
PHIL 575. *Contemporary Topics III.* ★3 (either term, 3-0-0).
PHIL 577. *Contemporary Topics IV.* ★3 (either term, 3-0-0).
PHIL 580. *Topics in Philosophy of Law.* ★3 (either term, 3-0-0).
PHIL 581. *Directed Reading I.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.
PHIL 582. *Directed Reading II.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.
PHIL 583. *Directed Reading III.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.
PHIL 584. *Directed Reading IV.* ★3 (either term, 3-0-0). Prerequisite: Open only to graduate students beyond the qualifying year.
PHIL 676. *Reading Course I.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.
PHIL 677. *Reading Course II.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.
PHIL 678. *Reading Course III.* ★6 (3-0-0). Prerequisite: Open only to provisional candidates for the Ph.D.

204.66 Physical Education

204.66.1 THE DEGREES OF M.A., M.SC. AND PH.D.

(1) The Department of Physical Education offers programs leading to the degrees of Master of Arts, Master of Science, and Doctor of Philosophy.

(2) Well equipped facilities are available for a limited number of graduate students. Areas of specialization include: administration, physiology of exercise, sociocultural, psychology of sport, motor performance, and history.

(3) Requirements for admission conform with the general regulations of the Faculty of Graduate Studies and Research.

(4) Students enrolling in the M.A. degree program have the option of electing between a non-thesis or thesis degree route. A thesis M.A. is designed to prepare the student for entrance into a Ph.D. program. A non-thesis M.A. is designed to prepare the student for a career such as service in public and private agencies, or to provide an opportunity for experienced graduates to up-date their education.

(5) Students entering the non-thesis M.A. route must possess a Bachelor of Physical Education degree or equivalent and are expected to have a minimum of three years' experience in the field of physical education or recreation.

(6) The normal requirements for the M.A. thesis degree or the M.Sc. degree are the completion of four to six courses in addition to the thesis.

(7) Students enrolled in the non-thesis M.A. program must complete, as a minimum, two full courses above those required of a student with an equivalent academic background but pursuing the M.A. thesis degree. A significant piece of scholarly writing is to be submitted in lieu of the thesis.

(8) Course requirements for the Ph.D. program depend upon individual circumstances and must be approved by the Department of Physical Education. The main emphasis is on research leading to the dissertation.

(9) Depending on qualifications, the candidate for the master's degree should anticipate one to two years for completion. The Ph.D. degree will normally require two to three years beyond the master's level.

(10) Graduate Assistantships are available to a limited number of students.

(11) For further information write to: Chairman, Graduate Committee, Department of Physical Education, University of Alberta, Edmonton, Alberta T6G 2H9.

204.66.2 GRADUATE COURSES

THES 000. *Thesis.*

Graduate-level courses offered by the Department of Physical Education:

P ED 501. *Research and Directed Studies.* ★3 (First Term, 0-3s-0).
P ED 503. *Research and Directed Studies.* ★3 (Second Term, 0-3s-0).
P ED 507. *Graduate Seminar: A Seminar in Current Factors, Problems and Issues.* ★3 (either term; to be arranged, 0-3s-0).
PHYSL 507. *Thermoregulation and Energy Exchange.* ★3 (Second Term, 1-2s-0). Prerequisite: Introductory Physiology course or consent of the Department.
P ED 541. *Anthropometry and Physical Activity.* ★3 (Second Term, 1-2s-0). An examination of current research in anthropometry and body composition with special emphasis on obesity and weight control.
P ED 543. *Exercise Physiology Laboratory Techniques.* ★3 (First Term, 2-0-4). Prerequisite: Consent of the Department.
P ED 544. *Popular Physical Culture and Social Interaction.* ★3 (First Term, 1-2s-0).
P ED 545. *Sport and Society.* ★3 (Second Term, 1-2s-0).
P ED 546. *Psychosocial Aspects of Women in Sport.* ★3 (First Term, 0-3s-0). An examination of the role and significance of women in sport from a psychosocial research perspective.
P ED 547. *Exercise Testing and Exercise Prescriptions.* ★3 (First Term, 1-1s-2).

P ED 549. *Behavioral Analysis of the Athlete.* ★3 (either term, 0-3s-0). Prerequisite: P ED 303 or consent of the Department.

P ED 551. *Administrative Problems in Sport and Physical Education Programs.* ★3 (First Term, 1-2s-0).

P ED 553. *Administration of Sport and Physical Education Programs.* ★3 (Second Term, 1-2s-0).

P ED 561. *Seminar in Biomechanics.* ★3 (either term, 0-3s-0).

P ED 567. *Seminar in Human Motor Performance.* ★3 (Second Term, 0-3s-0). Selected topics of current interest in the field of human motor performance.

P ED 569. *Physical Growth and Development.* ★3 (First Term, 0-3s-0). An examination of selected topics in physical growth and motor development.

P ED 571. *Seminar in Sports Sciences.* ★3 (First Term, 0-3s-0).

P ED 573. *Adapted Physical Education.* ★3 (Second Term, 0-3s-0). Seminar and practicum in assessing, prescribing, teaching and evaluating physical activities of handicapped children with motor disabilities.

P ED 575. *Muscular Strength and Endurance.* ★3 (either term, 0-3s-0). Study of muscle contraction with emphasis on underlying mechanisms for improved functioning of cardiac and skeletal muscles.

P ED 577. *The Nature of Scientific Inquiry in Physical Education and Recreation.* ★3 (First Term, 1-2s-1). An introduction to the basic philosophy and nature of scientific inquiry as it applies to contemporary research.

P ED 578. *Social Research Applications to Sport.* ★3 (Second Term, 0-3s-0). An examination of quantitative and qualitative research methodologies as they apply to the sociology of sport.

P ED 587. *Cross-Cultural Comparative Analysis of Sport and Physical Recreation.* ★3 (First Term, 1-2s-0). An examination of sport and physical recreation in selected cultures with emphasis on the ramifications for Canada.

P ED 589. *Sport Under Socialism.* ★3 (Second Term, 1-2s-0). An examination of physical education programmes in selected cultures with emphasis on the ramifications for Canada.

P ED 591. *Pre-Renaissance Sport and Physical Education.* ★3 (First Term, 1-2s-0).

P ED 593. *Rise of Modern Sport and Physical Education.* ★3 (Second Term, 3-0-0).

P ED 599. *Directed Studies and Research.* ★3 (both terms, 0-1.5s-0).

P ED 601. *Directed Studies and Research.* ★3 (First Term, 0-3s-0).

P ED 603. *Directed Studies and Research.* ★3 (Second Term, 0-3s-0).

P ED 651. *Issues in Exercise Physiology.* ★3 (either term, 0-3s-0). Seminar dealing with current developments and selected controversial issues in the field of exercise physiology.

P ED 653. *Physiological Factors Affecting Performance.* ★3 (Second Term, 0-3s-0). Limited to Ph.D. students in Exercise Physiology or consent of the Department.

P ED 655. *Energy Mobilization and Training.* ★3 (Second Term, 0-3s-0). Cellular adaptations to acute and chronic exercise. Discussion of metabolic and structural adaptations during exercise.

P ED 657. *Seminar in Exercise Physiology.* ★3 (Second Term, 0-3s-0).

P ED 661. *History of Sport I.* ★3 (Second Term, 0-3s-0).

P ED 662. *Seminar in Comparative Physical Education and Sport.* ★3 (either term, 0-3s-0). The examination and development of conceptual frameworks for analyzing sport and physical education in selected nations of the world.

P ED 663. *Seminar in the History of Sport and Physical Education Before 1800.* ★3 (Second Term, 0-3s-0).

P ED 665. *Seminar in the History of Sport and Physical Education Since 1800.* ★3 (First Term, 0-3s-0).

P ED 667. *History of Sport and Physical Education in Canada.* ★3 (Second Term, 0-3s-0).

P ED 669. *Advanced Seminar in Growth and Development.* ★3 (either term, 0-3s-0). An advanced study of the research and theories of development of human motor performance related to maturation and environmental conditions.

P ED 673. *Advanced Seminar: Theory in Human Motor Performance.* ★3 (First Term, 0-3s-0).

P ED 675. *Advanced Seminar: Research and Design in Human Motor Performance.* ★3 (Second Term, 0-3s-0).

P ED 695. *Advanced Seminar in Biomechanics.* ★3 (either term, 0-3s-0).

P ED 699. *Directed Studies and Research.* ★3 (0-1.5s-0).

P ED 900. *Non-Thesis Project.* ★6 (variable). A significant piece of scholarly writing.

Graduate-level courses offered by the Department of Movement Education:

MOV 530. *Program Development in Elementary School Physical Education.* ★6 (0-3L-0).

MOV 581. *The Teaching of Movement Education.* ★3 (Second Term, 0-3L-0). Prerequisite: Consent of the Department.

MOV 599. *Directed Study.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

Graduate-level courses offered by the Department of Recreation Administration:

REC 500. *Theory and Practice of Public Recreation Administration.* ★3 (First Term, 3-0-0).

REC 501. *Directed Study.* ★3 (First Term,3-0-0).

REC 503. *Directed Study.* ★3 (Second Term,3-0-0).

REC 511. *The Historical Foundations of Public Recreation Administration.* ★3 (First Term, 3-0-0).

REC 531. *Socio-Psychological Dimensions of Recreation Involvement.* ★3 (Second Term, 3-0-0).

REC 551. *Public Recreation Services Policy and Planning.* ★3 (Second Term, 3-0-0).

REC 599. *Directed Study.* ★3 (1.5-0-0).

204.67 Physical Therapy

204.67.1 THE DEGREE OF M.SC.

(1) *Purpose of the Program:* To prepare physical therapists for leadership roles in academic, clinical, and laboratory settings by preparing them to undertake research to establish the effectiveness of various approaches to treatments used by physical therapists and by so doing, develop a strong scientific framework for the discipline of physical therapy.

The program has been designed in response to increased demands by academic and clinical institutions for therapists educated above the present baccalaureate level. It provides persons holding a baccalaureate degree in physical therapy with an opportunity for advanced study in their own field. The program at The University of Alberta offers advanced training in orthopaedics, sports therapy, therapeutic exercise, and other physical therapy specialty areas.

(2) *Entry to the Program.* To meet the requirements of the Faculty of Graduate Studies and Research, applicants must have a Grade Point Average (G.P.A.) of at least 6.0 in the last two years of their physical therapy baccalaureate program at The University of Alberta or an equivalent qualification from another institution. Applicants will be judged not only on their academic record, but also on their professional potential as indicated in letters of reference, interviews, and other supportive material; and they must also normally have had at least one year of clinical experience prior to being accepted into the program. It is possible to enter the program in January, May or September.

(3) *Format of the Program.* The proposed program normally takes two years. The Faculty of Graduate Studies and Research requires that a minimum of one academic year (8 months) must be spent in residence for a Master of Science Degree. Thus it may be possible to complete the program in less than two years depending on student's academic background.

During the first year of the program students are expected to select a pattern of courses in a particular area of interest which will enable them to bring their previous educational background in physical therapy

and associated fields to an advanced level, to enable them later to engage in meaningful research within that area.

In order that students may design a program which fits their particular needs, the Department of Physical Therapy requires only one compulsory course — PTHER 500: Research Seminar.

Students are required to pass a general competency examination in physical therapy. Normally, the examination takes place between the first and second year of the program. The examination, which may be oral or written, is under the direction of the Chairman of the Department of Physical Therapy or his/her designee, and the examination committee consists of members of the physical therapy teaching staff.

During the second year of the program, the student focuses on the development of research skills through appropriate course work in research methodology, directed study and activity with an in-depth exploration of his/her particular area of interest under faculty guidance.

Normally, the course requirements for the degree of Master of Science in Physical Therapy are four to six full courses, or their equivalent, at graduate level, in addition to the thesis. Students, in consultation with their advisor, will design a program of studies suitable to their particular needs and interests with course requirements being based on students' previous training and anticipated needs in their area of interest. Courses from other departments may be accepted as part of a student's total program. Some undergraduate course work may be contained in a student's program, providing that a minimum of four full graduate courses, or their equivalent, are also included. Credit for courses taken elsewhere may be granted Advanced Credit by the Dean of Graduate Studies and Research upon recommendation of the Department of Physical Therapy provided that the courses have not been counted towards a previous degree or program.

Each student will be required to complete a thesis based on independent investigation. The thesis will carry a weighting equivalent to at least 2 full graduate courses.

204.67.2 GRADUATE COURSES

THES 000. *Thesis.*

PTHER 500. *Research Seminar.* ★3 (either term, 0-3s-0). The examination, evaluation and preparation of the research proposal and research report. Student will discuss critically various aspects including: the selection of the problem, the review of the literature, the research hypothesis, the collection and analysis of the data, and the significance of the research.

PTHER 502. *Peripheral Articular Anatomy.* ★3 (either term, 1-1-2). Detailed functional and pathological anatomy of the peripheral joints of the body. Particular reference is given to the clinical relevance of the topics discussed.

PTHER 504. *Vertebral Articular Anatomy.* ★3 (either term, 1-1-2). Detailed functional and pathological anatomy of the vertabral joints of the body. Particular reference is given to the clinical relevance of the topics discussed.

PTHER 505. *Advanced Techniques of Movement Analysis.* ★3 (either term, 2-0-2). The principles, theory and application of advanced methods of movement analysis as related to physical therapy.

PTHER 506. *Electromyographic Kinesiology.* ★3 (either term, 2-0-2). Seminar and laboratory sessions on advances in electromyography applied to physical therapy and allied areas.

PTHER 507. *Instrumentation in Physical Therapy.* ★3 (either term, 2-0-2). A course on electronic fundamentals applied to measuring instruments and their basic components as used in physical therapy research.

PTHER 508. *Clinical Investigation Methods.* ★3 (either term, 2-0-2). Theory, analysis and application of advanced techniques used in physical therapy assessment and clinical research.

PTHER 509. *Tissue Biomechanics.* ★3 (either term, 2-0-2). A consideration of the mechanical properties of biological tissue in normal and selected pathological situations.

PTHER 510. *Rehabilitation Ergonomics.* ★3(either term, 2-0-2). The application of ergonomic principles in rehabilitation.

PTHER 530. *Research and Directed Studies.* ★3 (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 531. *Research and Directed Studies.* ★3 (either term, 3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 532. *Research and Directed Studies.* ★3 (1.5-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 533. *Research and Directed Studies.* ★6 (3-0-0). Work on a special project under the supervision of a faculty member. Prior approval of the instructor and the student's advisor required.

PTHER 540. *Practicum.* (Credit). A practicum in the student's area of concentration and interest to be taken by the student if his/her committee feels the student needs, or the student desires, further practical experience. This course may involve experience off campus in any geographical area where the student may gain the necessary experience.

PTHER 561. *Pathokinesiology of Peripheral Joints.* ★3 (either term, 1-0-2). The application of kinesiological analysis to the treatment of pathological conditions affecting the peripheral joints.

PTHER 562. *Pathokinesiology of the Spinal Joints.* ★3 (either term, 1-0-2). The principles, theory and application of advanced techniques of mobilization on selected spinal joint syndromes.

PTHER 568. *Advanced Sports Therapy.* ★3 (either term, 0-3s-0). Seminar on advances in Sports Therapy and other related topics.

PTHER 570. *Measurement and Evaluation in Physical Therapy.* ★3 (either term, 2-0-3). The principles involved in measurement and evaluation and their application in the practice of physical therapy.

PTHER 571. *Advanced Geriatric Rehabilitation.* ★3 (either term, 0-3s-0). Seminar on methods of assessment of physical programs of the elderly and the management of programs for care in various settings for the long term support of elderly patients.

PTHER 573. *Prosthetics and the Amputee.* ★3 (either term, 2-0-1). Management and rehabilitation problems arising from the design and use of prosthetics.

PTHER 575. *Advanced Therapeutic Exercises.* ★3 (either term, 2-0-1). Physiological and therapeutic principles in the evaluation and comparative analyses of various approaches to exercise.

PTHER 580. *Curriculum Analysis in Physical Therapy.* ★3 (either term, 0-3s-0). Analysis of curriculum and its relevance to the process of physical therapy undergraduate, graduate and continuing education.

PTHER 581. *Information Transfer in Physical Therapy Education.* ★3 (either term, 1-0-2). Application of the principles of information transfer to physical therapy undergraduate, graduate and continuing education.

204.68 Physics

204.68.1 THE DEGREES OF M.SC AND PH.D.

(1) Programs leading to the degrees of Master of Science and Doctor of Philosophy are open to suitable graduates in Physics, Engineering Physics, or equivalent programs, who meet the entrance requirements of the Faculty of Graduate Studies and Research.

(2) The Department's principal fields of research are:

Astrophysics: Astronomy, laboratory astrophysics, precision optical spectroscopy.

Geophysics: Geomagnetism, paleomagnetism, space physics, stable and radioactive isotope studies, theoretical and experimental seismology.

Nuclear Physics: Nuclear structure and nuclear reactions. A 6 MeV van de Graaff accelerator with a beam pulse compression system and an on-line computer permit a wide variety of experiments. The present staff are also involved in the operation of a 500 MeV negative ion cyclotron which is a joint project of four western universities (TRIUMF Project). The facility at Vancouver is now available for experimental work.

Low Temperature and Solid State Physics: Superconductors, semiconductors, solid helium, NMR, acoustic attenuation, electron microscopy, transport properties in metals.

Theoretical Physics: Solid state, physical acoustics, nuclear physics, elementary particles, field theory relativity, gravitational theory.

Other Areas: Radiation and medical physics, biophysics.

(3) Individual programs will be arranged in consultation with the Associate Chairman of the Department of Physics and members of the Department.

(4) A number of Graduate Assistantships are available and these range from $5,900 (for M.Sc. candidates) to $6,750 (for Ph.D. candidates). Applicants are considered automatically for this assistance when they are accepted in the graduate program. In addition to the above, a certain number of research supplements to the value of $1,900 are available during the summer.

(5) For an M.Sc. program in experimental physics a minimum of two full courses or equivalent is generally required by students with the equivalent of the Honors B.Sc. degree of The University of Alberta. For students in a theoretical program the minimum course requirement is three full courses or equivalent including Physics 680 and 682 or 684. A small research project, the results of which are presented in a thesis and an oral examination are also required. The program is designed so that it may be completed in one year under normal circumstances. A supervisory committee of three faculty members is appointed for each graduate student and in May of the first year of the program they make a formal recommendation on the candidate's potential in graduate work. At this time students may in certain cases be permitted to transfer directly to a Ph.D. program if their progress warrants it.

(6) *The Ph.D. program.* Students in an experimental program are required to take a minimum of five full session graduate courses or equivalent including Physics 680 after the equivalent of the Honors B.Sc. degree of The University of Alberta. These include the courses required for the M.Sc. program. An exception is made in the case of the Geophysics program where Physics 571 may be substituted for Physics 680. For the Theoretical program there is a minimum of six full session courses or equivalent after the Honors B.Sc. level including Physics 680, 683, 684 and 685. All students in the Ph.D. program are advised to take at least two half courses in fields of study different from their own research areas. When the course requirements are successfully completed and his/her research is well advanced, each Ph.D. student must pass an oral candidacy examination. The student's research is presented in thesis form and orally to an examining committee. The minimum time for a Ph.D. degree is three academic years of study and research after the Honors B.Sc. degree or two academic years after the equivalent of the M.Sc. degree at The University of Alberta.

(7) Information may be obtained by writing the Associate Chairman of the Department of Physics.

204.68.2 GRADUATE COURSES

THES 000. *Thesis.*

GEOPH 521. *Seismology and Physical Structure of the Earth.* ★3 (Second Term, 3-0-0).

GEOPH 523. *Geomagnetism, Potential Theory and Tectonophysics.* ★3 (First Term, 3-0-0).

GEOPH 525. *Electromagnetic and Potential Methods of Exploration.* ★3 (First Term, 3-0-0).

GEOPH 527. *Time Series in Applied Seismology.* ★3 (First Term, 3-0-0). Prerequisite: GEOPH 427 or equivalent; corequisite: PHYS 528.

GEOPH 528. *Applied Geophysics Field School and Laboratory.* ★5 (2-0-3).

PHYS 511. *Statistical Physics I.* ★3 (First Term, 3-0-0).

PHYS 513. *Statistical Physics II.* ★3 (Second Term, 3-0-0).

PHYS 515. *Introductory Solid State Physics.* ★3 (First Term, 3-0-0).

PHYS 517. *Introduction to Low Temperature Physics.* ★3 (Second Term, 3-0-0).

PHYS 545. *Theory of Classical Fields.* ★3 (Second Term, 3-0-0).

PHYS 561. *Atomic Spectroscopy.* ★3 (First Term, 3-0-0).

PHYS 563. *Physics of Stellar Atmospheres.* ★3 (either term, 3-0-0).

PHYS 565. *Physics of Stellar Interiors.* ★3 (either term, 3-0-0).

PHYS 571. *Quantum Mechanics B.* ★3 (First Term, 3-0-0).

PHYS 573. *Nuclear and Particle Physics.* ★3 (Second Term, 3-0-0).

PHYS 574. *Radiation Physics.* ★6 (3-0-0).

PHYS 591. *Advanced Laboratory.* ★3 (First Term, 0-6L-0).

PHYS 593. *Instrumentation B.* ★3 (Second Term, 3-0-0).

PHYS 599. *Special Projects.* ★3 (Second Term, 0-6L-0).

PHYS 601. *Seminar in Advanced Topics.* ★2 (0-1s-0). Weekly seminars are held in each of the following fields: Theoretical Physics, Nuclear Physics, Solid State Physics, Geophysics, of which the student must select one series.

PHYS 602. *Seminar in Special Topics.* ★2 (0-1s-0).

PHYS 611. *Semiconductors.* ★3 (either term, 3-0-0).

PHYS 613. *Superconductivity.* ★3 (either term, 3-0-0).

PHYS 615. *Lattice Defects in Solids.* ★3 (either term, 3-0-0).

PHYS 617. *Transport Properties in Metals.* ★3 (either term, 3-0-0).

PHYS 619. *Superfluids.* ★3 (either term, 3-0-0).

PHYS 620. *Geodynamics.* ★3 (either term, 3-0-0). To include emphasis on: I: paleomagnetism, II: rheology, III: tectonic theories, IV: heat flow or V: elastodynamics.

PHYS 621. *Geomagnetism I or II.* ★3 (either term, 3-0-0).

PHYS 623. *Time Sequence Analysis.* ★3 (First Term, 3-0-0).

PHYS 624. *Theoretical Seismology I or II.* ★3 (either term, 3-0-0).

PHYS 626. *I — Isotopic Studies of Stable and Radiogenic Elements; II — Mass Spectrometry — Instrumentation and Techniques.* ★3 (either term, 3-0-0).

PHYS 628. *Topics in Solar-terrestrial Relationships I or II.* ★3 (either term, 3-0-0).

PHYS 631. *Advanced Topics in Plasma and Space Physics I or II.* ★3 (either term, 3-0-0).

PHYS 660. *Atomic Theory and Spectroscopy.* ★3 (either term, 3-0-0).

PHYS 663. *Topics in Astronomy and Astrophysics I.* ★3 (either term, 3-0-0).

PHYS 664. *Topics in Astronomy and Astrophysics II.* ★3 (either term, 3-0-0).

PHYS 665. *Stellar Systems.* ★3 (either term, 3-0-0).

PHYS 672. *Advanced Nuclear Physics I.* ★3 (either term, 3-0-0).

PHYS 673. *Advanced Nuclear Physics II.* ★3 (either term, 3-0-0).

PHYS 674. *Experimental Topics in Nuclear Physics I.* ★3 (either term, 3-0-0).

PHYS 675. *Experimental Topics in Nuclear Physics II.* ★3 (either term, 3-0-0).

PHYS 676. *Nuclear Structure I.* ★3 (either term, 3-0-0).

PHYS 677. *Nuclear Structure II.* ★3 (either term, 3-0-0).

PHYS 680. *Advanced Quantum Mechanics.* ★6 (3-0-0).

PHYS 682. *Advanced Electromagnetic Theory I.* ★3 (First Term, 3-0-0).

PHYS 683. *Statistical Mechanics.* ★3 (First Term, 3-0-0).

PHYS 684. *Advanced Electromagnetic Theory II.* ★3 (Second Term, 3-0-0).

PHYS 685. *Quantum Field Theory I or II.* ★3 (either term, 3-0-0). I — Quantum Electrodynamics; II — General Quantum Field.

PHYS 686. *Critical Phenomena.* ★3 (Second Term, 3-0-0).

PHYS 688. *Solid State Theory.* ★6 (3-0-0).

PHYS 689. *Non-equilibrium Statistical Mechanics.* ★3 (either term, 3-0-0).

PHYS 690. *Fluid Mechanics.* ★3 (either term, 3-0-0).

PHYS 691. *Elementary Particle Physics I or II.* ★3 (either term, 3-0-0). I — Phenomenology; II — Summetries and Weak Interactions.

PHYS 692. *Group Theory and Applications.* ★3 (either term, 3-0-0).

PHYS 699. *Selected Topics in Theoretical Physics.* ★3 (either term, 3-0-0). I — Scattering Theory; II — Green's Function; III — Advanced Solid State Theory; IV — Mechanics of Fluids and Other Continua; V — Quantum Field Theory.

NOTE: 1. For a listing of courses offered jointly by the Departments of Mathematics and Physics see § 204.48.5.

2. Courses with different Roman numerals in their title have different course content.

204.69 Physiology

204.69.1 THE DEGREES OF M.SC. AND PH.D.

(1) Facilities are available for graduate training leading to the Master of Science and Doctor of Philosophy degrees. The Department is well equipped for most fields of physiological research including various areas of biophysics.

(2) Financial assistance in the form of Graduate Assistantships is usually available for graduate students.

(3) Information and requests for application forms for admission may be obtained from the Dean of the Faculty of Graduate Studies and Research. Students may also write to the Chairman of the Department in regard to their special interests and related matters.

204.69.2 GRADUATE COURSES

THES 000. *Thesis.*

PHYSL 403. *Neurophysiology.* ★3 (First Term, 3-0-0).

PHYSL 404. *Cardiovascular Physiology.* ★3 (Second Term, 3-0-0).

PHYSL 410. *Physiology.* ★6 (3-0-3; 3-0-0). Note: Available to Graduate and Science students. Prerequisites: BIOL 130 or 299, CHEM 200 and 250 or 350.

PHYSL 501. *Topics in Cardiovascular Physiology.* ★3 (Second Term, 3-0-0).

PHYSL 502. *Problems in Current Research.* ★3 (either term, 0-0-3).

PHYSL 503. *Biophysics of Nerve and Muscle.* ★3 (Second Term, 3-0-0).

PHYSL 504. *Physiology of Reproduction.* ★3 (First Term, 3-0-0).

PHYSL 505. *Topics in Neurophysiology.* ★3 (First Term, 3-0-0).

PHYSL 506. *Tutorial and Seminar Course.* ★3 (either term, 0-3s-0).

PHYSL 600. *Physiology Seminar.* ★0 (0-1s-0).

204.70 Plant Science

204.70.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Plant Science offers programs leading to the degrees of Master of Science and Doctor of Philosophy.

(2) The Department is equipped with laboratories, greenhouses, and growth chamber and field facilities for research in horticulture, plant pathology, plant physiology and biochemistry, weed science, range management, crop ecology, and plant breeding. Specific research interests of the Department include breeding and quality of forage, cereal and oil seed crops, weed control, plant growth regulators, grassland improvement, the physiology and production of greenhouse and other horticultural crops, host-pathogen relationships and protection of plants against disease, protein biochemistry, plant morphogenesis, ethylene metabolism, biochemistry of ageing tissue, and alkaloid metabolism.

(3) Course requirements in graduate programs are based on the student's previous training and anticipated needs in his / her field of specialization. Normally all advanced courses are acceptable as part of a graduate program. In addition, candidates must submit and defend a thesis based on research. Ph.D. candidates may, at the discretion of their supervisory committee, be required to demonstrate a competent reading knowledge of a language other than English, but there is no language requirement for the M.Sc.

(4) Length of programs will depend to some extent on the previous qualifications of the candidates.

(5) Financial assistance from research grants is available for a number of qualified candidates.

(6) Inquiries should be addressed to the Chairman of the Department.

204.70.2 GRADUATE COURSES

THES 000. *Thesis.*

Biometrics

PL SC 500. *Statistics for Biological Research.* ★3 (First Term, 3-0-3).

Crop Ecology and Plant Breeding

PL SC 501. *Reading Project in Ecology and Crop Production.* Weight according to work done to a maximum of ★6.

PL SC 502. *Research Project in Ecology and Crop Production.* Weight according to work done to a maximum of ★6.

PL SC 503. *Topics in Plant Breeding.* ★3 (Second Term, 3-0-0). Prerequisite: PL SC 465.

PL SC 504. *Reading Project in Plant Breeding.* Weight according to work done to a maximum of ★6.

PL SC 505. *Research Projects in Plant Breeding.* Weight according to work done to a maximum of ★6.

PL SC 515. *Research Projects—Forage.* Weight according to work done to a maximum of ★6.

PL SC 516. *Research Projects—Forage.* Weight according to work done to a maximum of ★6.

Horticulture

PL SC 507. *Reading Projects.* Weight according to work done to a maximum of ★6.

PL SC 508. *Research Projects.* Weight according to work done to a maximum of ★6.

PL SC 509. *Selected Topics in Horticulture.* Weight according to work done to a maximum of ★6.

Plant Pathology

PL SC 510. *Plant Virology.* ★3 (First Term, 3-0-3). Prerequisite: Consent of the instructor.

PL SC 511. *Reading Projects.* Weight according to work done to a maximum of ★6.

PL SC 512. *Research Projects.* Weight according to work done to a maximum of ★6.

PL SC 635. *Plant Pathogenesis.* ★3 (First Term, 3-0-0). Prerequisite: Consent of instructor.

PL SC 636. *Plant Pathogenesis.* ★3 (Second Term, 3-0-0). Prerequisite: Consent of instructor.

Plant Physiology and Biochemistry

PL SC 513. *Reading Projects in Plant Physiology and Biochemistry.* Weight according to work done to a maximum of ★6.

PL SC 514. *Research Projects in Plant Physiology and Biochemistry.* Weight according to work done to a maximum of ★6.

INT D 551. *Advanced Plant Biochemistry.* ★3 (Second Term, 3-0-0). Prerequisites: BIOCH 300, or PL SC 431 and 432 or consent of instructors.

Seminar in Plant Science

PL SC 600. *Plant Science Seminar.* ★1 (0-1s-0). Note: Required of all graduate students in Plant Science.

204.71 Political Science

204.71.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Political Science offers programs leading to the Master of Arts and Doctor of Philosophy degrees.

(2) The following fields of specialization are offered: Canadian Politics; Political Philosophy; International Politics; Comparative Politics; Urban Politics; Political Behaviour and Psychology.

(3) A number of Graduate Assistantships are available for qualified students.

(4) Enrolment in Political Science 502 and 503 is required of all students in the Ph.D. program unless such students can sufficiently demonstrate to the Department's satisfaction that they already possess proficiency in the areas of either or both courses they wish to by-pass.

(5) Each doctoral student shall demonstrate proficiency in a language other than English before taking the candidacy examination. The student's adviser or committee will determine the language most appropriate to the student's program and research interest. In addition, the student's adviser or committee may determine that a special skill such as statistics or another language other than English is essential to the student's program and require that the student demonstrate proficiency in that language or skill.

(6) The Department has initiated a research program in the field of strategic studies, under the auspices of a grant from the Department of National Defence. Students wishing to do graduate studies in this area are encouraged to contact the Department.

(7) Students contemplating graduate work in Political Science should direct their inquiries to the Chairman, Committee on Graduate Studies, Department of Political Science.

204.71.2 GRADUATE COURSES

THES 000. *Thesis.*

The consent of the Department is required for all 500 and 600-level courses.

POL S 500. *Conference Course.* ★6 (3-0-0).

POL S 501. *Comparative Institutions and Processes.* ★3 (either term, 3-0-0).

POL S 502. *Logic of Political Inquiry.* ★3 (either term, 0-3s-0).

POL S 503. *Principles of Research Design and Analysis.* ★3 (either term, 3-0-0).

POL S 506. *Empirical Political Theory.* ★3 (either term, 3-0-0).

POL S 510. *Advanced Study of Political Thought.* ★6 (3-0-0).

POL S 511. *Topics in Normative Analysis.* ★3 (either term, 3-0-0).

POL S 512. *Modern Social Theory.* ★3 (either term, 3-0-0).

POL S 515. *Statistics for Political Scientists.* ★4 (either term, 2-0-2).

POL S 516. *Problems in Marxist Political Theory.* ★3 (either term, 3-0-0).

POL S 521. *Canadian Government and Politics.* ★3 (either term, 3-0-0).

POL S 522. *Canadian Federalism.* ★3 (either term, 3-0-0).

POL S 523. *Canadian Political Parties.* ★3 (either term, 0-3s-0).

POL S 524. *Canadian Political Culture.* ★3 (either term, 3-0-0).

POL S 525. *Urban Analysis.* ★3 (either term, 3-0-0).

POL S 526. *Selected Topics in Urban Politics.* ★3 (either term, 3-0-0).

POL S 527. *Canadian Public Policy.* ★3 (either term, 3-0-0).

POL S 528. *Politics of Public Administration.* ★3 (either term, 3-0-0).

INT D 540. *Seminar on Comparative, Legal, Constitutional and Federal Studies.* ★6 (0-3s-0). Prerequisite: Consent of the Departments of History and Political Science. [Political Science]

POL S 545. *Topics in Communism.* ★3 (either term, 0-3s-0).

POL S 546. *Seminar in Soviet Government.* ★3 (either term, 0-3s-0).

INT D 546. *East European and Soviet Studies.* ★6 (0-3s-0). An interdisciplinary seminar.

POL S 550. *Comparative Politics: Theory and Analysis.* ★3 (either term, 0-3s-0).

POL S 551. *Comparative Politics: Selected Topics.* ★3 (either term, 3-0-0).

POL S 553. *Comparative Political Activism.* ★3 (either term, 3-0-0).

POL S 554. *Comparative Party and Group Politics.* ★3 (either term, 3-0-0).

POL S 555. *Territorial Organization in Nation States.* ★3 (either term, 0-3s-0).

POL S 560. *International Politics: I.* ★3 (First Term, 3-0-0).

POL S 561. *International Politics: II.* ★3 (Second Term, 0-3s-0).

POL S 562. *Canadian Foreign Policy.* ★3 (either term, 3-0-0).

POL S 564. *Conflict Resolution and Strategic Studies.* ★3 (either term, 3-0-0).

POL S 570. *Political Development: Theory.* ★3 (either term, 3-0-0).

POL S 571. *Political Development: Selected Topics.* ★3 (either term, 3-0-0).

POL S 578. *Asian Systems.* ★3 (either term, 3-0-0).

POL S 580. *Western European Systems.* ★3 (either term, 0-3s-0).

POL S 581. *Anglo-American Systems.* ★3 (either term, 3-0-0).

POL S 592. *Political Psychology.* ★3 (either term, 3-0-0).

POL S 593. *Political Behavior.* ★3 (either term, 3-0-0).

POL S 594. *The Comparative Study of Political Mass Movements.* ★3 (either term, 0-3s-0).

POL S 599. *Research Seminar for Non-Thesis M.A. Candidates.* ★6 (0-3s-0). Required of all non-thesis M.A. candidates in the year in which they expect to obtain their degree and involving the preparation and presentation of a major research paper.

POL S 607. *Comparative Federal Systems.* ★3 (either term, 3-0-0).

POL S 608. *Advanced Study in Comparative Politics.* ★3 (either term, 3-0-0).

POL S 609. *Readings in Comparative Politics.* ★3 (either term, 0-3s-0).

POL S 611. *Seminar in Contemporary Political Philosophy.* ★3 (either term, 0-3s-0).

POL S 612. *Topics in Classical Political Philosophy.* ★3 (either term, 3-0-0).

POL S 614. *Topics in the Logic of Political Inquiry.* ★3 (either term, 3-0-0). Prerequisite: POL S 502.

POL S 619. *Readings in Political Philosophy.* ★3 (either term, 3-0-0).

POL S 620. *Topics in Canadian Government and Politics.* ★3 (either term, 3-0-0).

POL S 625. *Readings in Urban Analysis.* ★3 (either term, 0-3s-0).

POL S 626. *Administrative Practices.* ★3 (either term, 3-0-0).
POL S 629. *Readings in Canadian Government and Politics.* ★3 (either term, 0-3s-0).
POL S 660. *International Politics.* ★3 (either term, 3-0-0).
POL S 663. *Problems of International Organization.* ★3 (either term, 3-0-0).
POL S 668. *Readings in International Studies.* ★3 (either term, 3-0-0).
POL S 690. *Research Practicum in Political Behavior and Psychology.* ★3 (either term, 3-0-0). Prerequisite or Corequisite: POL S 592 or 593.
POL S 695. *Advanced Topics in Political Behavior and Psychology.* ★3 (either term, 3-0-0). Prerequisite or Corequisite: POL S 592 or 593.
POL S 699. *Readings in Political Behavior and Psychology.* ★3 (either term, 3-0-0).
POL S 900. *Non-Thesis Project.* ★3 (either term, 3-0-0).

204.72 Psychology

204.72.1 THE DEGREES OF M.A., M.SC. AND PH.D.

(1) The Department of Psychology offers graduate work leading to the degrees of M.A., M.Sc. and Ph.D.

(2) Research facilities include laboratories for human and animal experimentation, operating rooms and a histology laboratory for physiological work, counselling and observation rooms equipped with modern equipment.

(3) Requirements for the master's degree include:

(i) demonstration of competence in Psychology 530 (Experimental Design) and at least six single-term courses selected from departmentally designed options within three or more of the following five areas:
Human experimental
Social-personality
Psychobiology
Applied-clinical
Theoretical and quantitative methods.

No more than three single-term courses may be taken from any one category.

(ii) thesis research in one of the following areas of specialization within psychology: animal learning and physiological, developmental, cognitive information processing, perception and psychophysics, personality and psychopathology, psychological aesthetics, social, and theoretical.

(4) Requirements for the Ph.D. include:

(i) demonstration of competence in the areas of the courses listed in Para.(3) above (except for students entering the program with a master's degree who are required to take at least four rather than six of the designated options), and in addition:
PSYCO 698. *Advanced Research Techniques I*
and / or
PSYCO 699. *Advanced Research Techniques II.*

(ii) Candidacy examination and thesis research in one of the areas listed in (3) (ii) above. Amount of depth as opposed to breadth may vary in accordance with candidate's interest. Individual programs are determined in consultation with the Department.

(5) Graduate Assistantships for research and teaching are normally available for students who maintain satisfactory performance of their assistantship duties and make satisfactory progress towards a degree. In addition a certain number of assistantships are available during the summer. Application for financial assistance should be submitted to the Chairman, Department of Psychology by March 1.

204.72.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

PSYCO 433. *Test Theory.* ★3 (either term, 3-0-0).
PSYCO 444. *Decision Making.* ★3 (either term, 3-0-2).
PSYCO 465. *Cognitive Processes.* ★3 (Second Term, 3-0-3).
PSYCO 466. *Advanced Perception.* ★3 (Second Term, 3-0-0).
PSYCO 467. *Determinants of Perceptual Experience.* ★3 (Second Term, 3-0-0).
PSYCO 475. *Biological Bases of Behavior.* ★3 (First Term, 0-0-4).
PSYCO 476. *Physiological Psychology.* ★3 (Second Term, 3-0-3).

204.72.3 GRADUATE COURSES

THES 000. *Thesis.*
PSYCO 503. *Systems of Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 504. *Conference Course in Psychology.* ★3 (First Term, 3-0-3).
PSYCO 505. *Conference Course in Psychology.* ★3 (Second Term, 3-0-3).
PSYCO 530. *Experimental Design.* ★6 (3-0-0).
PSYCO 531. *Advanced Scaling Theory.* ★3 (either term, 3-0-0).
PSYCO 532. *Multivariate Methods in Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 533. *Theory of Data Analysis.* ★3 (Second Term, 3-0-0).
PSYCO 534. *Principles of Psychological Assessement.* ★3 (Second Term, 3-0-0).
PSYCO 535. *Clinical Assessment I.* ★6 (3-0-3).
PSYCO 536. *Clinical Assessment II.* ★6 (3-0-3).
PSYCO 537. *Clinical Method I.* ★6 (4-0-0).
PSYCO 539. *Clinical Method II.* ★6 (3-0-3).
PSYCO 540. *Seminar in Social Psychology.* ★6 (0-3s-0).
PSYCO 541. *Advanced Social Psychology.* ★3 (First Term, 3-0-0).
PSYCO 542. *Research Methods in Social Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 543. *Social and Personality Development.* ★3 (Second Term, 3-0-0).
PSYCO 550. *Experimental Analysis of Personality.* ★3 (either term, 3-0-0).
PSYCO 560. *Memory and Cognition.* ★3 (Second Term, 3-0-0).
PSYCO 561. *Advanced Psychology of Learning.* ★3 (First Term, 3-0-0).
PSYCO 562. *Advanced Psychology of Perception.* ★3 (Second Term, 3-0-0).
PSYCO 563. *Psychophysics.* ★3 (First Term, 3-0-0).
PSYCO 564. *Sensory Processes.* ★3 (First Term, 3-0-0).
PSYCO 565. *Seminar in Learning Theory.* ★3 (First Term, 0-3s-0).
PSYCO 567. *Psychology of Development.* ★3 (First Term, 3-0-0).
PSYCO 568. *Seminar in Psychology of Development.* ★3 (either term, 0-3s-0).
PSYCO 569. *Cognition.* ★3 (Second Term, 3-0-0).
PSYCO 570. *Drugs and Behavior.* ★3 (either term, 3-0-0).
INT D 570. *Seminar in Philosophy and Psychology I.* ★3 (First Term, 0-3s-0).
INT D 571. *Seminar in Philosophy and Psychology II.* ★3 (Second Term, 0-3s-0).
PSYCO 575. *Advanced Physiological Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 576. *Human Neuropsychology.* ★3 (either term, 3-0-0).
PSYCO 577. *Seminar in Physiological Psychology.* ★3 (either term, 0-3s-0).
PSYCO 578. *Experimental Psychopathology.* ★3 (either term, 3-0-3).
PSYCO 580. *Advanced Psychology of Personality.* ★3 (First Term, 3-0-0).
PSYCO 582. *Multivariate Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 584. *Seminar in Personality Theory.* ★3 (0-3s-0).
PSYCO 585. *Seminar in Theories of Perception.* ★3 (either term, 0-3s-0).

PSYCO 587. *Basis of Abnormal Behavior.* ★3 (First Term, 3-0-0).
PSYCO 588. *The Psychoses.* ★6 (3-0-0).
PSYCO 591. *Approaches to Treatment.* ★6 (Second Term, 3-0-0).
PSYCO 592. *Psychological Therapies.* ★6 (3-0-3).
PSYCO 599. *Honors Thesis.* ★6 (0-0-6).
PSYCO 610. *Special Topics in Learning.* ★3 (First Term, 3-0-0).
PSYCO 611. *Topics in Learning.* ★3 (Second Term, 3-0-0).
PSYCO 612. *Topics in Perception.* ★3 (First Term, 3-0-0).
PSYCO 613. *Topics in Perception.* ★3 (Second Term, 3-0-0).
PSYCO 614. *Special Topics in Social Psychology.* ★3 (First Term, 3-0-0).
PSYCO 615. *Topics in Social Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 616. *Special Topics in Personality.* ★3 (First Term, 3-0-0).
PSYCO 617. *Topics in Personality.* ★3 (Second Term, 3-0-0).
PSYCO 618. *Special Topics in Clinical Psychology.* ★3 (First Term, 3-0-0).
PSYCO 619. *Topics in Clinical Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 620. *Special Topics in Cognition.* ★3 (First Term, 3-0-0).
PSYCO 621. *Topics in Cognition.* ★3 (Second Term, 3-0-0).
PSYCO 622. *Special Topics in Developmental Psychology.* ★3 (First Term, 3-0-0).
PSYCO 623. *Topics in Developmental Psychology.* ★3 (Second Term, 3-0-0).
PSYCO 631. *Special Topics in Theoretical Psychology I.* ★3 (First Term, 0-3s-0).
PSYCO 632. *Special Topics in Theoretical Psychology II.* ★3 (Second Term, 0-3s-0).
PSYCO 633. *Special Topics in Psychological Statistics.* ★3 (either term, 3-0-0).
PSYCO 648. *Research.* ★3 (First Term, 3-0-3).
PSYCO 649. *Research.* ★3 (Second Term, 3-0-3).
PSYCO 660. *Seminar in Theory Construction: Analysis.* ★3 (First Term, 0-3s-0).
PSYCO 661. *Seminar in Theory Construction: Synthesis.* ★3 (Second Term, 0-3s-0).
PSYCO 668. *Seminar in Theoretical Psychology I.* ★3 (First Term, 0-3s-0).
PSYCO 669. *Seminar in Theoretical Psychology II.* ★3 (Second Term, 0-3s-0).
PSYCO 672. *History of Psychology.* ★3 (either term, 3-0-0).
PSYCO 698. *Advanced Research Techniques I.* ★3 (First Term, 0-3L-0).
PSYCO 699. *Advanced Research Techniques II.* ★3 (Second Term, 0-3L-0).

204.73 Radiology

204.73.1 THE DEGREE OF M.SC.

(1) Facilities exist within the Department of Radiology, University Hospital and The University of Alberta, for students who wish to proceed to the Master of Science degree.

(2) Research may be carried out in the following fields:

(i) Radiological aspects of Nuclear Medicine.
(ii) Clinical or Basic Radiology.
(iii) Health Physics.
(iv) Radiological Physics (arranged in co-operation with the Physics Department).
(v) Instrumentation.
(vi) Ultrasonic Diagnosis.
(vii) Alternative imaging modalities.

(3) Entrance requirements are graduation in Medicine for the clinical research areas, and in the appropriate scientific disciplines for the other research studies.

(4) Appropriate course work to be decided upon in conjunction with the Chairman of the Department or Director of Diagnostic Radiological Research.

(5) Length of the program is one or two years.

(6) Support can be obtained from several grant-awarding agencies for work in these areas.

(7) Inquiries should be directed to the Chairman of The Department or the Director of Diagnostic Radiological Research, Department of Radiology, University of Alberta Hospital, Edmonton.

204.74 Romance Languages

204.74.1 THE DEGREES OF M.A. AND PH.D.

(1) Graduate work leading to the degrees of M.A. and Ph.D. may be taken in the major areas of Romance Linguistics, French, French-Canadian, Italian and Hispanic Literatures. (M.A. only in Italian and French-Canadian.)

(2) Two M.A. routes are available in French, a thesis M.A. (Literature) and a non-thesis M.A. (Translation).

(3) The master's degree French-Canadian or Spanish or Italian requires three courses over and above the eight courses of an Honors program in that field, for a total of eleven courses, plus the thesis (a student presenting five courses may enter as a Qualifying Graduate Student).

(4) Two M.A. routes are available in Romance Linguistics; a) a thesis M.A. designed to prepare the student for entrance into a Ph.D. program; b) a non-thesis M.A. designed to prepare the student for careers such as Community College teaching.

(5) The M.A. or an equivalent degree from a recognized university is normally required for admission to the Ph.D. program. The Ph.D. in French Literature requires four courses in the literature of the graduate field of specialization and the doctoral thesis, as well as the fulfilment of such pre-candidacy requirements as may be determined by the supervisory committee. The Candidacy Examination will be taken in the major Literature only. Students working towards the Ph.D. in Hispanic Literature are required to take four graduate level courses in the literature of the field of specialization, to pass the prescribed departmental and faculty candidacy examinations, and to complete the doctoral dissertation. The Faculty Candidacy Examination is an oral examination of the field of specialization on the basis of a reading list drawn up by the candidate and the supervisor and approved by the supervisory committee. Prior to the Faculty Candidacy Examination, the following departmental requirements must be fulfilled: students must write the prescribed examinations in the literature of the field of their specialization, and they must have already demonstrated a competent reading knowledge of a second Romance language and literature, the latter to be examined orally on the basis of a prepared reading list. (Latin will be accepted in lieu of a second Romance language.) Students working towards the Ph.D. in Romance Linguistics are required to take a minimum of four graduate level courses. Doctoral studies in Romance Linguistics require proficiency in one Romance language, plus linguistic work on three Romance languages (Latin may be substituted for one of the preceding), plus a reading knowledge of a language other than English or a Romance language, plus a pre-candidacy research paper. Some knowledge of Latin is strongly recommended.

(6) Graduate Assistantships, and Third Term (May to August) Assistantships are available. Non-thesis students are not eligible for Third Term Assistantships.

(7) Prospective candidates should direct their inquiries to the Associate Chairman of the Department.

204.74.2 GRADUATE COURSES

THES 000. *Thesis.*

French

FREN 500. *Reading Course.* ★6 (3-0-0). This course is for graduate students who wish to satisfy the language requirement of their department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. NOTE: Not open to undergraduates.

FREN 515. *Advanced Exercises in Translation: French into English.* ★3 (either term, 3-0-0). Prerequisite: FREN 415.

FREN 516. *Advanced Exercises in Translation: English into French.* ★3 (either term, 3-0-0). Prerequisite: FREN 416.

FREN 521. *The History of French Literary Criticism to the Eighteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 522. *History of French Literary Criticism From the Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 531. *Studies in Medieval French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 600.

FREN 542. *Studies in the French Renaissance.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 551. *Studies in Seventeenth Century French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 550.

FREN 560. *Studies in Eighteenth Century French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: Consent of the Department.

FREN 570. *Studies in the Romantic Period in France.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 470.

FREN 574. *Studies in French Realism.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 475.

FREN 576. *Studies in French Prose and Poetry of the late Nineteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 480.

FREN 580. *Studies in Twentieth Century French Theatre.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 581. *Studies in the Twentieth Century French Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 575.

FREN 582. *Studies in Twentieth Century French Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Note: Formerly FREN 685.

FREN 599. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 611. *History of French Syntax: from its Origins to 1500.* ★3 (either term, 3-0-0), or ★6 (3-0-0).

FREN 613. *History of French Syntax: From 1500 to the Present.* ★3 (either term, 3-0-0), or ★6 (3-0-0). Prerequisite: FREN 611 or consent of the Department.

FREN 622. *Seminar in French Theatre: II.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 623. *Seminar in French Poetry.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 624. *Methods of Research.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 625. *Bibliography and Thesis Style.* ★1 (First Term, 0-1s-0).

FREN 626. *Seminar in French Literary Criticism.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 632. *The Spirit of Humanism in France up to the Renaissance.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 635. *Seminar in Medieval French Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Prerequisite: FREN 531 or consent of the Department.

FREN 641. *Seminar in French Renaissance Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 652. *Seminar in Seventeenth Century Literature.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 662. *Seminar in Eighteenth Century Literature.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 663. *The Eighteenth Century Novel.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 671. *The Naturalistic Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 672. *Seminar in Nineteenth Century Literature.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 675. *The Late Nineteenth Century Theatre.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 680. *Seminar in Twentieth Century Literature.* ★6 (3-0-0). Prerequisite: an undergraduate course in twentieth century French literature.

FREN 684. *Studies in the Contemporary French Novel.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 697. *Special Reading Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FREN 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FREN 900. *Non-thesis Project.* ★3 (variable).

204.74.3 GRADUATE COURSES

French-Canadian Literature

FR CA 501. *French Canadian Literary History and Criticism.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite: Consent of the Department.

FR CA 597. *Readings in French-Canadian Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 599. *Conference Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite: Consent of the Department.

FR CA 600. *Directed Reading.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 624. *Seminar: Literature of New France.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

FR CA 625. *Seminar: Nonfiction, 1760-1867.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 626. *Seminar: Nonfiction since 1867.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 627. *Seminar: Nineteenth Century Fiction.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 628. *Seminar: Nineteenth Century Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 629. *Seminar: Nineteenth Century Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 630. *Seminar: Twentieth Century Fiction.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 631. *Seminar: Twentieth Century Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 632. *Seminar: Twentieth Century Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 633. *Seminar: French Canadian Literature of Western Canada.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 640. *Seminar: French and French-Canadian Literary Relations.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

FR CA 690. *Bibliography and Thesis Style.* ★1 (First Term, 0-1s-0).

FR CA 691. *Methods of Research.* ★3 (First Term, 3-0-0).

FR CA 699. *Graduate Conference Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

204.74.4 GRADUATE COURSES

Italian

ITAL 500. *Contemporary Italian Literary Aesthetics.* ★6 (3-0-0). Prerequisite: Two senior Italian courses.

ITAL 501. *Bibliography and Thesis Style.* ★1 (either term, 2-0-0).

ITAL 510. *Literary Movements of the Twentieth Century.* ★6 (3-0-0).

ITAL 570. *Early Humanist Comedy.* ★6 (3-0-0).

ITAL 580. *The Literature of "Trattati d'Arte".* ★6 (3-0-0).

ITAL 590. *Goldoni and the Theatre of the Eighteenth Century.* ★6 (3-0-0).

ITAL 599. *Conference Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite: Consent of the Department.

ITAL 600. *Topics in Thirteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 610. *Topics in Fourteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 620. *Topics in Fifteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 630. *Topics in Sixteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 640. *Topics in Seventeenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 650. *Topics in Eighteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 660. *Topics in Nineteenth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 670. *Topics in Twentieth Century Italian Literature.* ★3 or ★6 (either term, 3-0-0).

ITAL 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

204.74.5 GRADUATE COURSES

Romance Linguistics

R LIN 501. *Topics in Applied Linguistics: French Phonology.* ★3 (either term, 3-0-0). Prerequisite: R LIN 401.

R LIN 502. *Topics in Applied Linguistics: French Morphology and Syntax.* ★3 (either term, 3-0-0). Prerequisite: R LIN 402.

R LIN 503. *Early Romance.* ★3 (either term, 3-0-0). The linguistic evolution from Latin until the appearance of the first Romance texts. Prerequisites: Two half courses in Romance linguistics or equivalent. Note: Formerly R LIN 505. Students cannot receive credit in both R LIN 503 and 505.

R LIN 504. *Seminar in Portuguese.* ★3 (Second Term, 0-3s-0). Prerequisite: PORT 502.

R LIN 508. *Seminar in Romanian.* ★3 (Second Term, 3-0-0). Prerequisite: R LIN 360.

R LIN 511. *Seminar in Applied Romance Linguistics.* ★3 (either term, 0-3s-0); or ★6 (0-3s-0).

R LIN 570. *Romance Structure: from Latin to French.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503.

R LIN 580. *Romance Structure: from Latin to Spanish.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503.

R LIN 590. *Romance Structure: from Latin to Italian.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite or Corequisite: R LIN 503.

R LIN 595. *Seminar in Comparative Romance Linguistics.* ★3 (either term, 3-0-0). Prerequisite: R LIN 503.

R LIN 599. *Conference Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite: Consent of the Department.

R LIN 600. *Diachronic Theories in Romance Linguistics.* ★3 (either term, 3-0-0). A survey of the development of historical linguistic studies in the Romance area, and a comparison of the main contemporary theoretical approaches to Romance diachronic studies.

R LIN 610. *Topics in Romance Linguistics.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

R LIN 611. *Advanced Seminar in Romance Linguistics.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

R LIN 620. *Romance Dialectology.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

R LIN 670. *Topics in French Grammar.* ★3 (either term, 3-0-0); or ★6 (3-0-0). Prerequisite: Consent of the Department.

R LIN 699. *Conference Course.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

R LIN 900. *Non-thesis Project.* ★3 (variable).

Note: For additional courses related to the above, see French 611. *History of French Syntax: from its origins to 1500,* and French 613. *History of French Syntax: from 1500 to the present.*

204.74.6 GRADUATE COURSES

Hispanic Languages and Literatures

CATLN 501. *Catalan.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Introduction to spoken and written modern Catalan, with references to historical developments in older stages of the language.

CATLN 685. *Seminar on Medieval Catalan Literature.* ★3 (either term, 0-3s-0); or ★6 (0-3s-0).

CATLN 690. *Seminar on Contemporary Catalan Literature.* ★3 (either term, 0-3s-0); or ★6 (0-3s-0).

PORT 502. *Portuguese.* ★3 (either term, 3-0-0). Introduction to modern Portuguese.

SPAN 500. *Reading Course.* ★6 (3-0-0). This course is for graduate students who wish to satisfy the language requirement of their department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. NOTE: Not open to undergraduates.

SPAN 501. *Teaching Strategies for the Instruction of Spanish.* ★0 (First Term, 1-1s-0).

SPAN 503. *Spanish Dialectology.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 510. *Spanish Semantics and Lexicography.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 512. *History of the Spanish Language.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 550. *Medieval Narrative Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 560. *Medieval Spanish Prose.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 565. *Medieval Lyric Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 590. *Seminar in Golden Age Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 595. *Literary Theory in the Golden Age.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 600. *The Literature of the Discovery, Conquest and Colonization of America.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 610. *The Sentimental Romances and the Books of Chivalry. The Pastoral and Moresque Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 611. *The Dialogue Novel, from Rojas' "La Celestina" to Lope's "La Dorotea".* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 612. *The Picaresque Novel.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 615. *Cervantes.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 620. *Sixteenth Century Drama.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 624. *Lope de Vega.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 626. *Tirso de Molina and Juan Ruiz de Alarcón.* ★3 (either term, 3-0-0); or ★6 (3-0-0).

SPAN 627. *Calderón.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 630. *The Romancero.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 633. *The Poetry of the Baroque Period.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 635. *Góngora.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 640. *Quevedo and Gracían.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 650. *The Novel, Poetry and Drama of the Eighteenth Century.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 660. *The Romantic Movement.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 665. *Galdos and his Contemporaries.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 669. *The "Modernista" Movement.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 670. *Contemporary Spanish Poetry.* ★3 (either term 3-0-0) or ★6 (3-0-0).

SPAN 671. *Contemporary Spanish Novelists.* ★3 (either term 3-0-0) or ★6 (3-0-0).

SPAN 672. *Contemporary Spanish-American Poetry.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 673. *Contemporary Spanish-American Novelists.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 674. *Seminar in Spanish-American Literature.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 675. *Unamuno.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 690. *Problems of Criticism in Hispanic Literatures.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SPAN 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

204.75 Rural Economy

204.75.1 THE DEGREES OF M.AG., M.SC., AND PH.D.

(1) The Department of Rural Economy offers programs leading to the Master of Agriculture, Master of Science and Doctor of Philosophy degrees. Programs at the Master's level are offered in agricultural finance, management, marketing, policy, prices, production, international trade, forest economics, natural resources, rural development, and rural sociology.

(2) Master of Agriculture programs consist of ten single-term courses plus a project (AG EC 900) equivalent in weight to at least a single-term course. A candidate with adequate undergraduate prerequisites and appropriate professional experience may complete the program in one academic session. A minimum of one term in residence is required.

(3) Master of Science programs consist of at least six single-term courses plus a thesis equivalent in weight to four to six single-term courses. At least four single-term courses must be in addition to specified undergraduate course requirements. A minimum of two terms in residence is required.

(4) Doctor of Philosophy programs include, in addition to the Master of Science course requirements, preparation for candidacy examinations in economic theory, quantitative techniques, the field of specialization, and a supporting field. Fields of specialization are *limited* to marketing, natural resource, and production economics.

(5) Information about details of program requirements and financial assistance may be obtained from the Department.

204.75.2. UNDERGRADUATE COURSES

The following may be taken for graduate credit:

AG EC 416. *Statistical Analysis.* ★3 (First Term, 3-0-2).

AG EC 423. *Management Techniques in Agriculture and Forestry.* ★3 (Second Term, 3-0-0).

AG EC 433. *Advanced Farm and Ranch Management.* ★3 (Second Term, 3-0-0).

AG EC 435. *Agriculture and Forestry Law.* ★3 (either term, 3-0-0).

AG EC 475. *Agricultural Development.* ★3 (Second Term, 3-0-0).

AG EC 484. *Agricultural Marketing Economics.* ★3 (Second Term, 3-0-0).

FOREC 445. *Forest Production Economics.* ★3 (Second Term, 3-0-0).

INT D 456. *Rural Social Problems and Public Policy.* ★3 (either term, 3-0-0).

INT D 458. *Agrarian Social Movements.* ★3 (First Term, 3-0-0).

INT D 459. *Introduction to Community Development.* ★3 (either term, 3-0-0).

INT D 465. *Natural Resource Utilization.* ★3 (either term, 3-0-0).

INT D 486. *Livestock and Meat Marketing.* ★3 (Second Term, 3-0-0).

R SOC 391. *Principles of Rural Extension.* ★3 (First Term, 3-0-0).

R SOC 415. *Socio-economic Research Techniques.* ★3 (either term, 3-0-2).

R SOC 491. *Planning and Evaluation of Extension Programs.* ★3 (Second Term, 3-0-0).

204.75.3 GRADUATE COURSES

THES 000. *Thesis.*

Agricultural Economics

AG EC 500. *Research Projects in Agricultural Economics.* ★3 (either term, 3-0-0) or ★6 (3-0-0). Investigations of special problems involving field or library study and preparation of written reports. Credit according to work done. (Note: May be repeated for credit one time.) Prerequisite: Consent of the Department Chairman.

AG EC 502. *Theoretical Applications to Agricultural Economics.* ★3 (First Term, 3-0-0). Elements of production, marketing, and welfare theories, and cost theory extensions, with applications to agricultural problems. Prerequisite: Consent of the instructor.

AG EC 513. *Agricultural Econometrics.* ★3 (either term, 3-0-3). Introduction to research methodology, linear regression model, econometric theory, sampling theory and experimental design. Prerequisite: AG EC 416 or equivalent.

AG EC 514. *Quantitative Techniques.* ★3 (either term, 3-0-3). Application of econometric extensions, operations research, mathematical programming, and input-output analysis to problems in agricultural economics. Prerequisites: Consent of the instructor; AG EC 416 and AG EN 420 recommended.

AG EC 515. *Research Methodology.* ★3 (either term, 3-0-0). Problem identification and analysis, inductive procedures, formulating and testing hypotheses, causal analysis, rules of inference, role of theory, designing research projects. Prerequisite: Consent of the instructor; AG EC 416 recommended.

AG EC 533. *Production Economics.* ★3 (either term, 3-0-3). Static and dynamic firm theory, production principles applied to resource use, resource and product combinations, cost structure, uncertainty and expectations. Prerequisites: Consent of the instructor; AG EC 502 and 416 recommended.

AG EC 565. *Natural Resources Economics.* ★3 (either term, 3-0-0). Availability, utilization, and quality of natural resources; criteria for resource development and conservation; public policy problems and analysis. Prerequisites: Consent of the instructor; AG EC 502 and 416 recommended.

AG EC 573. *Agricultural Economics Policy.* ★3 (either term, 3-0-0). Goals and instruments of agricultural policy, model constructions with decision and control criteria; national, regional, and provincial agricultural applications. Prerequisites: Consent of the instructor; AG EC 502 and 416 recommended.

AG EC 575. *Agriculture in Developing Countries.* ★3 (either term, 3-0-0). The role of agriculture in the economic growth of developing countries; influence of international trade and commodity agreements on economic development. Prerequisite: Consent of the instructor; AG EC 475 and 502 recommended.

AG EC 584. *Marketing Economics.* ★3 (either term, 3-0-0). Market competition, price and location theories; market structure analysis; and market performance criteria. Note: Formerly AG EC 563. Prerequisites: Consent of the instructor; AG EC 502 and 416 recommended.

AG EC 585. *Agricultural Trade and Price Analysis.* ★3 (either term, 3-0-0). Concepts underlying agricultural specialization and trade; spatial and behavioral price analyses; trade controls and commodity agreements. Prerequisite: Consent of the instructor; AG EC 485 recommended.

AG EC 601. *Agricultural Economics Seminar.* ★1 (Full Term, 0-1s-0). Reports by students, staff and visitors on studies of the literature, current research, and thesis projects. A field trip of approximately four days to study rural resources within Alberta will be arranged each spring, but it will not necessarily be required for all students. (All graduate students will be required to register for this course on a continuing basis while in residence at the University.)

AG EC 633. *Production Economics Research.* ★3 (either term, 3-0-0). Analysis of selected research problems; design of research projects in production economics. Prerequisite: AG EC 533 or equivalent.

AG EC 665. *Natural Resources Economics Research.* ★3 (either term, 3-0-0). Analysis of selected research problems and designing of research projects dealing with natural resources of importance to agriculture. Prerequisite: AG EC 565 or equivalent.

AG EC 684. *Marketing Economics Research.* ★3 (either term, 3-0-0). Analysis of selected research problems; design of research projects in marketing economics. Prerequisite: AG EC 584 or equivalent.

AG EC 900. *Non-Thesis Project.* ★variable (variable).

Forest Economics

FOREC 543. *The Management of Forest Capital.* ★3 (First Term, 3-0-0). The course deals with the consideration of the management and control of timber capital along with joint international control and production of other valued forest re-

sources. The aim of the course is to develop the managerial conditions for optimum resource control and exploitation. Prerequisites: Graduate standing and intermediate economic theory, or permission of the instructor. (Offered jointly by the departments of Forest Science, and Rural Economy.) [Forest Science]

FOREC 545. *Economics of Timber Utilization.* ★3 (either term, 3-0-0). Concerns introduction of wood processing industries into areas of predominantly old growth stock; optimum depletion rates and sustention of yield, development of infrastructure; siting mills; transportation and the pattern of development of wood processing industries; the role of the forest industries in regional development. Prerequisite: Consent of the instructor; FOREC 445 recommended. [Rural Economy]

Rural Sociology

R SOC 556. *Human Resources Development.* ★3 (either term, 3-0-0). The role of human resources in social and economic development. Strategies for development of knowledge, skills and attitudes desirable in the development process. Training of change agents and lay readers for community development and continuing education process. Prerequisite: Consent of the instructor.

R SOC 557. *Comparative Rural Societies.* ★3 (either term, 3-0-0). The structure and characteristics of rural societies in various countries, with emphasis upon adjustment to change in social and economic institutions. Prerequisite: Consent of the instructor; INT D 456 recommended.

204.76 Secondary Education

204.76.1 THE DEGREES OF M.ED., ED.D AND PH.D

(1) The Department of Secondary Education offers programs leading to the Master of Education, with or without thesis, Doctor of Philosophy, and Doctor of Education degrees.

(2) Before a student can be admitted as a candidate for the M.Ed. or higher degree, his / her record must be acceptable to the Faculty of Graduate Studies and Research and to the Department.

(3) Graduate instruction in the above degree programs is designed to develop competencies as: master teachers, educators in the specific disciplines, curriculum and instruction specialists, and curriculum and instruction scholars.

(4) Graduate programs in Secondary Education normally include advanced studies in the following a subject matter specialization, curriculum and instruction related to a specific discipline, more general curriculum perspectives and, inquiry into the nature of education and its practice. The particular program for each student is designed in consultation with a staff advisor designated by the Chairman of the Department.

(5) Normal course load per term consists of nine to twelve credits. Students in the non-thesis M.Ed. route normally accumulate forty-eight credits in course work and present a project in colloquium. Students in the thesis M.Ed. route normally complete thirty-six credits in course work, and complete and successfully defend a thesis. Normally, teaching experience and an undergraduate degree of appropriate quality are required for admission to M.Ed. programs.

(6) The Ed.D. and Ph.D. programs normally require two full years of residence. This involves four terms of full-time study with a minimum of nine credits per term.

(7) Assistantships are available to qualified candidates for the M.Ed., Ed.D. or Ph.D. in Secondary Education for services rendered in the Department's programs.

(8) Application forms for admission to a program are available from the Faculty of Graduate Studies and Research and further information regarding the programs may be secured by writing to the Chairman of the Department of Secondary Education.

204.76.2 COURSES FOR GRADUATE CREDIT

The following may be taken for graduate credit:

THES 000. *Thesis.*

ED CI 950. *Non-thesis Project.* ★3.

Curriculum and Instruction

ED CI 443. *School Library Services.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346 or consent of the Department.

ED CI 446. *Selection of School Library Materials.* ★3 (either term, 3-0-0). Prerequisite: ED CI 346.

ED CI 447. *Organization of School Library Materials.* ★3 (either term, 3-0-2). Prerequisite: ED CI 346.

ED CI 448. *The Mathematics Curriculum in the Elementary and Secondary School.* ★3 (either term, 3-0-0).

ED CI 450. *The Teacher's Role in Curriculum Development.* ★3 (either term, 3-0-0).

ED CI 453. *Teaching Language and Composition in the Secondary School.* ★3 (either term, 3-0-0).

ED CI 458. *New Approaches to Second Language Instruction.* ★3 (either term, 0-3L-0).

ED CI 459. *Advanced Curriculum and Instruction in Second Language Teaching.* ★3 (either term, 0-3L-0).

ED CI 462. *Innovations in Secondary School Social Studies Curriculum.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 463. *New Approaches in Secondary School Social Studies Instruction.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 466. *The Use of Computers in the Teaching and Learning of Mathematics.* ★3 (either term, 3-0-1). Prerequisite: ED CI, 364 or consent of the Department.

ED CI 472. *Methods and Resources for Teaching Secondary School Biology.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 473. *The Physics and Chemistry Curriculum in the Senior High School.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 476. *Testing and Evaluation in Science Teaching at the Secondary School Level.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 477. *The Nature of Science and Its Implications for Science Teaching.* ★3 (either term, 0-3L-0). Prerequisite: Consent of the Department.

ED CI 480. *Advanced Curriculum and Instruction in Secondary Business Education I.* ★3 (either term, 3-0-0). Prerequisite: ED CI 378 or 478 or consent of the Department.

ED CI 481. *Advanced Curriculum and Instruction in Secondary School Business Education II.* ★3 (either term, 3-0-0). Prerequisite: ED CI 480.

ED CI 484. *Advanced Curriculum and Instruction in Secondary School Home Economics.* ★3 (either term, 3-0-0). Prerequisite: ED CI 382 / 383 or consent of the Department.

ED CI 486. *Fine Arts Criticism in the Secondary School.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

ED CI 491. *Practicum in Secondary School Music II.* ★6 (0-6L-0).

ED CI 495. *Curriculum and Instruction in Secondary School Physical Education.* ★3 (Second Term, 3-0-0). Prerequisite: ED CI 494.

ED CI 499. *Guided Individual Study in Secondary Education.* ★3 (either term, 3-0-0). Prerequisite: Consent of the instructor and the Department.

ED CI 547. *Directed Study in School Library Programs.* ★3 (either term, 3-0-0). Prerequisite: ED CI 446 and 447 or consent of the Department.

ED CI 549. *Curiculum Development.* ★3 (First Term, 3-0-0). Curriculum theory and research with particular reference to determinants of curriculum, curriculum development, implementation and evaluation.

ED CI 550. *Current Curriculum Developments.* ★3 (Second Term, 3-0-0). Problems and practices in innovation and evaluation of current curriculum developments.

ED CI 560. *Instructional Planning in Secondary School Social Studies.* ★3 (either term, 3-0-0).

ED CI 561. *Historical Methodology in Secondary School Social Studies.* ★3 (either term, 3-0-0).

ED CI 564. *Secondary Mathematics Education Research Seminar.* ★3 (First Term, 3-0-0).

ED CI 565. *Secondary Mathematics Education Program Development.* ★3 (Second Term, 3-0-0).

ED CI 570. *Science and Society: Implications for Teaching.* ★3 (either term, 0-3s-0).

ED CI 574. *Instructional Strategies in Science Teaching.* ★3 (either term, 0-3s-0).

ED CI 596. *Research Methods in Secondary Education.* ★3 (First Term, 3-0-0). Normally enrolment is limited to Secondary Education M.Ed. students.

ED CI 597. *Research Design in Secondary Education.* ★3 (Second Term, 3-0-0). Normally enrolment is limited to Secondary Education students on thesis programs. Presentation of a formal thesis proposal is a course requirement. Prerequisite: ED CI 596.

ED CI 598. *Conference Seminar in Secondary Education I.* ★3 (either term, 0-3s-0).

ED CI 599. *Advanced Level Guided Individual Study in Secondary Education 1, 2 or 3.* ★3 (variable).

ED CI 649. *Curriculum Evaluation.* ★3 (First Term, 3-0-0). An Inter-departmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3 (either term, 3-0-0). The preparation and implementation of an evaluation study in the field.

ED CI 654. *Seminar Secondary Education English.* ★6 (0-3s-0).

ED CI 656. *Seminar Secondary Education Second Language.* ★6 (0-3s-0).

ED CI 660. *Seminar Secondary Education Social Studies.* ★6 (0-3s-0).

ED CI 664. *Seminar Secondary Education Mathematics.* ★6 (3-0-0).

ED CI 670. *Development, Implementation and Evaluation of Science curricula.* ★3 (either term, 0-3s-0).

ED CI 674. *Current Issues and Trends in Science Education.* ★3 (either term, 0-3s-0).

ED CI 678. *Seminar Secondary School Business Education.* ★6 (0-3s-0).

ED CI 682. *Seminar Secondary Education Home Economics.* ★6 (0-3s-0).

ED CI 685. *Current Issues in Art Education.* ★3 (First Term, 3-0-0).

ED CI 686. *Directed Study in Art Education.* ★3 (Second Term, 3-0-0).

ED CI 687. *Seminar Secondary Education Music.* ★6 (0-3s-0).

ED CI 689. *Seminar Secondary Education Drama.* ★6 (0-3s-0).

ED CI 694. *Seminar: Curriculum in Secondary School Physical Education.* ★3 (First Term, 3-0-0).

ED CI 695. *Seminar: Instruction in Secondary School Physical Education.* ★3 (Second Term, 3-0-0).

ED CI 696. *Secondary Education.* ★6 (3-0-0). Conference course in Secondary Education.

ED CI 697. *The Curriculum of Teacher Education.* ★6 (3-0-0).

ED CI 698. *Conference Seminar in Secondary Education II.* ★3 (either term, 0-3s-0).

Audiovisual Education

ED AV 465. *Principles of Graphic Communication.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 467. *Principles of Photographic Communication.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 470. *Curricular Integration of Audiovisual Materials.* ★3 (either term, 3-0-0). Prerequisite: ED AV 361, prerequisite or corequisite: ED AV 363 or consent of the Department.

ED AV 471. *Educational Technology and Communication.* ★3 (either term, 3-0-0). Prerequisite: ED AV 361; prerequisite or corequisite: ED AV 363 or consent of the Department.

ED AV 473. *Designing Multi-Media Instruction.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 471.

ED AV 481. *Television in Education: Production and Use.* ★3 (either term, 3-0-3). Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 483. *Educational Television: Preparation of Instructional Materials for Television Use.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 481 or consent of the Department.

ED AV 559. *Intermediate Production in Instructional Media.* ★3 (either term, 3-0-3). Prerequisite: ED AV 467or consent of the Department.

ED AV 561. *Organization and Supervision of the Audiovisual Media Program I.* ★3 (either term, 3-0-0). Prerequisites: ED AV 361 and ED AV 363.

ED AV 563. *Organization and Supervision of the Audiovisual Program II.* ★3 (either term, 3-0-3). Prerequisite: ED AV 561.

ED AV 571. *Developing Multi-Media Instructional Materials I.* ★3 (either term, 0-3L-0). Prerequisite or corequisite: ED AV 465, ED AV 467 or consent of the Department.

ED AV 573. *Developing Multi-Media Instructional Materials II.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 571.

ED AV 580. *Graduate Seminar in Educational Media.* ★6 (3-0-0). Prerequisites: ED AV 471 and 473 or ED AV 462 or consent of the Department.

ED AV 581. *Educational Television: Direction and Script Writing.* ★3 (either term, 3-0-3). Prerequisite: ED AV 483 or consent of the Department.

ED AV 583. *Educational Television: Survey of Educational Application.* ★3 (either term, 0-3L-0). Prerequisite: ED AV 481 or consent of the Department.

Education—Business

EDBUS 460. *Curriculum and Instruction in Secondary School Distributive Education I.* ★3 (either term, 3-0-0). Prerequisite: Consent of the Department.

EDBUS 461. *Curriculum and Instruction in Secondary School Distributive Education II.* ★3 (either term, 3-0-0). Prerequisite: EDBUS 460.

EDBUS 481. *The Curriculum Laboratory in Business Education.* ★3 (either term, 3-0-0). The development of units for indivualized and group instruction. Prerequisite: Student teaching experience or consent of the instructor.

EDBUS 483. *Curriculum and Instruction for Work Experience Programs.* ★3 (either term, 3-0-0).

EDBUS 485. *Supervised Occupational Experience.* ★3 (either term, 100 hrs. 0-1L-0). Required of business students who do not have one year of work experience.

204.77 Slavic Languages

204.77.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Slavic Languages offers programs leading to the degrees of Master of Arts and Doctor of Philosophy.

(2) M.A. programs are offered in (a) Russian, Ukrainian, Slavic Linguistics, Slavic Literatures, and (b) East European and Soviet Studies. Ph.D. programs are offered in Slavic Languages and Literatures and in Slavic Linguistics. The Department will approve only fields of study in which adequate library resources and supervision are available.

(3) Requirements for the M.A. degree include:

(i) for 2(a), completion of a minimum of six single-term courses, including Slavics 515; for 2(b), completion of a minimum of four half courses from within the Department; Interdisciplinary 546 and one other area-related full-year course, or two half-year courses outside the Department.

(ii) demonstration of a knowledge of Russian adequate for graduate study (normally, for specialists in Russian, a passing grade in RUSS 501 and RUSS 502 during the first year in the program); competent reading knowledge of either

French or German or one Slavic language other than Russian;

(iii) submission and oral defence of a thesis.

Students are asked to consult the Department concerning acceptable areas of research and course requirements in the various areas of specialization.

(4) To be admitted as a provisional candidate for the Ph.D., a student must normally hold the equivalent of the M.A. in Slavic Languages from The University of Alberta. Students whose M.A. work was done at other universities may be required to make up program deficiencies by special examination or by course-work. Any make-up examinations are to be taken within one year following admission as a provisional Ph.D. candidate.

(5) General requirements for the Ph.D. include the completion of a minimum of eight single-term courses beyond the master's degree, including two single-term courses in a minor subject, and the submission and oral defence of a dissertation. Specific requirements include:

(i) for students in *Slavic Languages and Literatures:*

(a) *Russian Language and Literature:* comprehensive knowledge of Russian literature and general knowledge of at least one of the other Slavic literatures and cultures; active knowledge of Russian. The suggested minor in this program is Comparative Literature.

(b) *Ukrainian Language and Literature:* comprehensive knowledge of Ukrainian literature and general knowledge of at least one of the other Slavic literatures and cultures; active knowledge of Ukrainian. The suggested minor in this program is Comparative Literature.

(c) *Ukrainian Oral Literature:* comprehensive knowledge of Ukrainian oral literature and general knowledge of at least one of the other Slavic oral literatures; active knowledge of Ukrainian; and an approved minor.

In all three programs competent reading knowledge of one other Slavic Language and of French or German is required.

(ii) for students in *Slavic Linguistics:* comprehensive knowledge of the history and structure of one Slavic language and general knowledge of the history and structure of each of the three groups of Slavic languages (East, West and South Slavic); active knowledge of one Slavic language; competent reading knowledge of Russian, of French or German, and of one West Slavic and one South Slavic language. The suggested minor in this program is Linguistics.

(6) *Candidacy examination:* Two three-hour written examinations covering the candidate's area of specialization. If the student passes the written examination, he / she will be examined orally on his / her area of specialization and on his / her dissertation proposal.

(7) Candidates for the M.A. must spend at least one academic year in full-time residence. The residence requirement for Ph.D. students is a minimum of two years. At the Department's discretion, a student may be permitted to spend up to one year of the period of residence at another institution (preferably, in a Slavic-speaking country).

(8) Financial aid is available in the form of Graduate Assistantships. Applications for these assistantships should be made before March 1 and should be sent to the Chairman of the Department.

204.77.2 GRADUATE COURSES

THES 000. *Thesis.*

Russian

RUSS 500. *Reading Course.* ★6 (3-0-0). This course is for graduate students who wish to satisfy the language requirement of their Department. An intensive study of essential grammar, reading of graded texts, and translation of texts from the student's own field. Note: Not normally open to undergraduates.

RUSS 501. *Composition and Conversation I.* ★3 (First Term, 3-0-0).

RUSS 502. *Composition and Conversation II.* ★3 (Second Term, 3-0-0).

RUSS 503. *Russian Stylistics I.* ★3 (either term, 3-0-0).

RUSS 504. *Russian Stylistics II.* ★3 (either term, 3-0-0).

RUSS 511. *The Structure of Russian I: Syntax.* ★3 (First Term, 3-0-0).

RUSS 512. *The Structure of Russian II: Phonology.* ★3 (Second Term, 3-0-0).

RUSS 516. *Medieval Muscovite Literature.* ★3 (either term, 3-0-0). Russian literature from the Fourteenth Century to the end of the Seventeenth.

RUSS 551. *Eighteenth Century Russian Literature and Culture.* ★3 (either term, 3-0-0). Russian literature during the century of Russia's Europeanization as seen against the background of philosophical, religious, esthetic and social problems.

RUSS 571. *History of Russian Criticism.* ★3 (First Term, 3-0-0). A detailed study of the history of Russian literary criticism, with emphasis on the Nineteenth and Twentieth Centuries.

RUSS 572. *Russian Literary Theory.* ★3 (Second Term, 3-0-0). A detailed study of the various trends in Russian literary theory, with emphasis on formalism and realism in literary scholarship.

RUSS 641. *Studies in Russian Poetry.* ★3 (either term, 3-0-0).

RUSS 643. *Studies in Russian Realism.* ★3 (either term, 3-0-0).

RUSS 645. *Studies in Soviet Russian Literature.* ★3 (either term, 3-0-0).

RUSS 647. *Aspects of Modernism in Russian Literature.* ★3 (either term, 3-0-0). This course is designed to deal with various aspects of the literary movements generally known as "Symbolism" and "Decadence".

RUSS 650. *Topics in Russian Literature.* ★3 (either term, 3-0-0).

RUSS 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

RUSS 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). A detailed study of a literary problem, period, or genre not dealt with in the other Honors or Graduate courses. Designed to meet the needs of individual Honors or Graduate students.

Slavics

SLAV 501. *An Introduction to Research in Slavic Literatures and Linguistics.* ★2 (First Term, 2-0-0).

SLAV 515. *Old East Slavic Literature.* ★3 (either term, 3-0-0). Survey of Old East Slavic Literature up to the Fourteenth Century, with emphasis on literary documents from Kiev and Novgorod.

SLAV 518. *Comparative Slavic Linguistics.* ★3 (Second Term, 3-0-0). Methods of comparative linguistics as applied to the Slavic languages.

SLAV 522. *Historical Grammar of East Slavic.* ★3 (Second Term, 3-0-0). Detailed discussion of some specific problems in the historical development of Russian, Ukrainian, and Byelorussian.

SLAV 541. *Slavic Syntax.* ★3 (either term, 3-0-0).

SLAV 542. *Slavic Phonology.* ★3 (either term, 3-0-0).

SLAV 561. *History of the West Slavic Languages.* ★3 (either term, 3-0-0).

SLAV 562. *History of the South Slavic Languages.* ★3 (either term, 3-0-0).

SLAV 650. *Topics in Slavic Linguistics.* ★3 (either term, 3-0-0).

SLAV 696. *Readings in Old Slavic Texts.* ★3 (either term, 3-0-0) or ★6 (3-0-0).

SLAV 699. *Conference Course.* ★3 (either term, 3-0-0) or ★6 (3-0-0). This course is designed to meet the needs of individual Honors and Graduate students in Slavic Languages and

Literatures. The course will normally deal with a Slavic language or national literature not offered in the other Honors and Graduate courses.

Ukrainian

UKR 503. *Ukrainian Stylistics.* ★3 (either term, 3-0-0).
UKR 504. *Problems in English-Ukrainian Translation.* ★3 (either term, 3-0-0).
UKR 511. *The Structure of Ukrainian.* ★3 (First Term, 3-0-0).
UKR 516. *Medieval Ukrainian Literature.* ★3 (either term, 3-0-0). Study of the major sources and trends in Ukrainian literature from the Fourteenth to the Seventeenth Centuries.
UKR 517. *Ukrainian Dialectology.* ★3 (either term, 3-0-0).
UKR 531. *History of Ukrainian Folklore Studies.* ★3 (either term, 3-0-0).
UKR 532. *Ukrainian Folklore in Canada.* ★3 (either term, 3-0-0).
UKR 631. *Topics in Ukrainian Folklore.* ★3 (either term, 3-0-0).
UKR 641. *Studies in Ukrainian Poetry.* ★3 (either term, 3-0-0).
UKR 642. *Studies in Ukrainian Drama.* ★3 (either term, 3-0-0).
UKR 643. *Studies in the Soviet Ukrainian Novel.* ★3 (either term, 3-0-0).
UKR 650. *Topics in Ukrainian Literature.* ★3 (either term, 3-0-0).
UKR 696. *Studies in Individual Authors.* ★3 (either term, 3-0-0) or ★6 (3-0-0).
UKR 699. *Conference Course.* ★3 (either term, 3-0-0). A detailed study of some literary problem, period, or genre not dealt with in the other Honors and Graduate courses. Designed to meet the needs of individual Honors or Graduate students.

204.78 Sociology

204.78.1 THE DEGREES OF M.A. AND PH.D.

(1) The Department of Sociology offers programs leading to the degrees of Master of Arts and Doctor of Philosophy.

(2) Three M.A. programs are available: (1) a thesis M.A. designed to prepare the student for entrance into a Ph.D. program; (2) a non-thesis M.A. designed to prepare the student for careers such as community college teaching and service in public and private agencies; and (3) specialized M.A. programs in Corrections, Demography.

(3) The Ph.D. program is designed to prepare the student for intensive professional specialization in two sub-areas of sociology of interest to the student. There are also Ph.D. specialization programs in Demography and Family and a conjoint Ph.D. Program in Sociology (Health Care Planning and Evaluation) conjointly administered with the Division of Health Services Administration.

(4) Application forms for admission are available from the Faculty of Graduate Studies and Research. Further information regarding the above programs may be obtained by writing the Associate Chair, Department of Sociology.

(5) A number of Graduate Assistantships are available. Stipends vary from $4,500 to $6,656 for the eight month academic year depending upon qualifications. Application for assistantships should be made to the Associate Chair. Other scholarships and fellowships are available through the Student Awards Office.

204.78.2 GRADUATE COURSES

THES 000. *Thesis.*
SOC 503. *Conference Course in Sociology for Graduate Students.* ★3 (First Term, 3-0-0).
SOC 504. *Conference Course in Sociology for Graduate Students.* ★3 (Second Term, 3-0-0).
SOC 511. *Multivariate Analysis.* ★3 (First Term, 3-0-0). Note: Offered in alternate years with Sociology 512. Prerequisite: SOC 311.
SOC 512. *Advanced Methods of Sociological Inquiry.* ★3 (Second Term, 3-0-0). Note: Offered in alternate years with Sociology 511. Prerequisite: SOC 311.
SOC 514. *Evaluation Research.* ★3 (either term, 3-0-0). Prerequisite: SOC 411.
SOC 519. *Selected Topics in Research.* ★3 (either term, 0-3s-0).
SOC 521. *Seminar in Theories of Deviance.* ★3 (First Term, 0-3s-0).
SOC 522. *Selected Topics in Deviance and Social Control.* ★3 (Second Term, 0-3s-0).
SOC 523. *Criminal Justice in the Community.* ★2 (1-0-0). Restricted to M.A. (Corrections) students. Prerequisite: Consent of the Department.
SOC 524. *Field Placement in Criminal Justice.* ★3 (either term, 3-0-0). Restricted to M.A. (Corrections) students. Prerequisite: Consent of the Department.
SOC 525. *Seminar in Criminal Justice Administration.* ★3 (either term, 0-3s-0).
SOC 526. *Seminar in Criminological Theory.* ★3 (either term, 0-3s-0).
SOC 527. *Seminar in Correctional Theory.* ★3 (either term, 0-3s-0).
SOC 531. *Seminar in the History of Sociological Thought.* ★3 (either term, 0-3s-0).
SOC 532. *Seminar in Theory Construction.* ★3 (either term, 0-3s-0).
SOC 533. *Logic of Sociological Inquiry.* ★3 (either term, 3-0-0).
SOC 534. *Contemporary Sociological Concepts.* ★3 (either term, 3-0-0).
SOC 537. *Seminar in the Sociology of Knowledge.* ★3 (either term, 0-3s-0).
SOC 541. *Seminar in Symbolic Behavior.* ★3 (either term, 0-3s-0).
SOC 542. *Small Group Behavior.* ★3 (either term, 3-0-2).
SOC 543. *Seminar in Mass Phenomena.* ★3 (either term, 0-3s-0).
SOC 544. *Seminar in Socialization Processes.* ★3 (either term, 0-3s-0).
SOC 550. *Historical Demography.* ★3 (either term, 3-0-0).
SOC 551. *Seminar in Demography.* ★3 (either term, 0-3s-0).
SOC 553. *Seminar in Urban Society.* ★3 (either term, 0-3s-0).
SOC 555. *Human Ecology.* ★3 (either term, 3-0-0).
SOC 556. *Selected Topics in Environmental Sociology.* ★3 (either term, 3-0-0).
SOC 561. *Seminar in Social Organization.* ★3 (either term, 0-3s-0).
SOC 562. *Seminar in Social Class.* ★3 (either term, 0-3s-0).
SOC 565. *Seminar in Work.* ★3 (either term, 0-3s-0).
SOC 566. *Seminar in Formal and Complex Organization.* ★3 (either term, 0-3s-0).
SOC 568. *Seminar in Ethnic and Minority Relations.* ★3 (either term, 0-3s-0).
SOC 570. *Seminar in Family Theory.* ★3 (either term, 0-3s-0).
SOC 571. *Seminar in Issues and Techniques in Family Theory Construction.* ★3 (either term, 0-3s-0).
SOC 572. *Selected Topics in Canadian Society.* ★3 (either term, 0-3s-0).
SOC 573. *Advanced Social Psychology of Health and Illness.* ★3 (either term, 3-0-0).
SOC 574. *Advanced Social Organization of Health Care.* ★3 (either term, 3-0-0).
SOC 575. *Seminar in Aging and Age Differentiation.* ★3 (either term, 0-3s-0).
SOC 576. *Seminar in Sociology of Religion.* ★3 (either term, 0-3s-0).
SOC 577. *Seminar in Sex Stratification and Sex Differentiation.* ★3 (either term, 0-3s-0).
SOC 578. *Seminar in Marital and Family Interaction.* ★3 (either term, 0-3s-0).
SOC 580. *Seminar in Sociology of Modernization.* ★3 (either term, 0-3s-0).
SOC 593. *Seminar in Political Sociology.* ★3 (either term, 0-3s-0).
SOC 603. *Conference Course.* ★3 (First Term, 3-0-0).
SOC 604. *Conference Course.* ★3 (Second Term, 3-0-0).
SOC 605. *Seminar in Teaching and Professional Skills.* ★3 (First Term, 0-3s-0).

SOC 611. *Selected Topics in Social Statistics.* ★3 (either term, 0-3s-0). Note: Offered in alternate years with SOC 612.

SOC 612. *Selected Topics in Social Research.* ★3 (either term, 0-3s-0). Note: Offered in alternate years with SOC 611.

SOC 631. *Seminar in Advanced Sociology Theory.* ★3 (either term, 0-3s-0).

SOC 633. *Mathematical Sociology.* ★3 (either term, 0-3s-0).

SOC 641. *Selected Topics in Social Psychology.* ★3 (either term, 0-3s-0).

SOC 642. *Experimental Small Group Research.* ★3 (either term, 0-3s-0).

SOC 652. *Seminar in Population, Social and Economic Development.* ★3 (either term, 0-3s-0).

SOC 661. *Seminar in the Sociological Profession.* ★2 (0-1s-0).

SOC 670. *Seminar in Advanced Topics in Family Theory and Research.* ★3 (either term, 0-3s-0).

SOC 673. *Seminar in Medical Sociology I.* ★3 (either term, 0-3s-0).

SOC 674. *Seminar in Medical Sociology II.* ★3 (either term, 0-3s-0).

SOC 675. *Seminar in Medical Sociology III.* ★3 (either term, 0-3s-0).

SOC 900. *Non-Thesis Project.* ★3 (variable). Note: For Graduate Students in the Sociology Non-Thesis M.A. Program. Prerequisite: Consent of the Department.

In addition to the above courses, Sociology graduate students may take any two of the following five Educational Foundations courses for graduate credit:

EDFDN 517. *Education and Social Change.* ★3 (either term, 3-0-0).

EDFDN 519. *Sociology of Higher Education.* ★3 (either term, 3-0-0).

EDFDN 562. *Development and Theory of Sociology of Education.* ★3 (either term, 3-0-0). Formerly EDFDN 513.

EDFDN 563. *Research Methods in Sociology of Education.* ★3 (either term, 3-0-0). Formerly EDFDN 515.

EDFDN 573. *Functions of Education in the Development of Emerging Nations.* ★3 (either term, 3-0-0).

204.79 Soil Science

204.79.1 THE DEGREES OF M.AG., M.SC. AND PH.D.

(1) The Department of Soil Science offers programs leading to the Master of Agriculture, Master of Science and Doctor of Philosophy degrees. Fields of interest in the Department of Soil Science include: genesis, classification (taxonomic and interpretive), physics, chemistry, soil colloids, nutrient cycling, microbiology, remote sensing, fertility and conservation.

(2) Requirements for the Master of Agriculture degree are ten single-term course equivalents plus a project (Soils 900), the latter equivalent in weight to at least a single-term course.

(3) Requirement for the Master of Science degree are at least six single-term course equivalents plus the seminar and thesis.

(4) There are no fixed requirements for the Doctor of Philosophy degree. The candidate and supervisory committee will select courses as may be necessary to enable the candidate to carry out an acceptable research program.

(5) Candidates for all post-graduate degrees are expected to participate in the Department's seminar program.

(6) Details regarding program requirements and availability of financial assistance may be obtained from the Chairman, Department of Soil Science.

204.79.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

*SOILS 415. *Inorganic Soil Components.* ★3 (Second Term, 3-0-3).

*SOILS 420. *Soil Formation and Classification.* ★3 (First Term, 3-0-3).

SOILS 425. *Soil and Land Evaluation.* ★3 (Second Term, 3-0-3).

*SOILS 430. *Soil Microbiology and Biochemistry.* ★3 (Second Term, 3-0-3).

*SOILS 440. *Soil Physics.* ★3 (First Term, 3-0-3).

*SOILS 450. *Soil Chemistry.* ★3 (First Term, 3-0-3).

SOILS 460. *Soil Fertility.* ★3 (First Term, 3-0-3).

SOILS 470. *Land Drainage.* ★3 (Second Term, 3-0-0).

SOILS 485. *Soil Reclamation and Conservation.* ★3 (Second Term, 2-4s-0).

*These courses are prerequisites to the M.Ag. program and, if taken, must be listed as courses taken to clear deficiencies.

204.79.3 GRADUATE COURSES

THES 000. *Thesis.*

SOILS 501. *Individual Study.* Weight according to work done to a maximum of ★6.

SOILS 502. *Individual Study.* Weight according to work done to a maximum of ★6.

SOILS 503. *Individual Study.* Weight according to work done to a maximum of ★6.

SOILS 504. *Individual Study.* Weight according to work done to a maximum of ★6.

NOTE: Except for SOILS 600 and SOILS 900, the following courses are offered only when justified by enrollment, normally in alternate years.

SOILS 520. *Advanced Soil Classification.* ★3 (Second Term, 3-0-3).

SOILS 530. *Advanced Soil Microbiology.* ★3 (First Term, 3-0-3).

SOILS 535. *Advanced Soil Biochemistry.* ★3 (Second Term, 1.5-1.5s-3).

SOILS 540. *Advanced Soil Physics.* ★3 (First Term, 3-0-3).

SOILS 550. *Advanced Soil Chemistry.* ★3 (Second Term, 3-0-3).

SOILS 555. *Soil Mineralogy.* ★3 (Second Term, 3-0-3).

SOILS 600. *Seminar.* ★1 (0-1s-0).

SOILS 620. *Experimental Pedology.* ★3 (Second Term, 3-0-3).

SOILS 900. *M.Ag. Research Project.* Weight according to work done from a minimum of ★3.

204.80 Surgery

204.80.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department offers research facilities in the Surgical Medical Research Institute and the Clinical Sciences Building for graduate students who wish to register for the degree of M.Sc., or Ph.D., in Experimental Surgery.

(2) The Surgical-Medical Research Institute is well equipped for all types of experimental work on animals of all sizes. The Surgical Research Laboratories in the Clinical Sciences Building are well equipped to meet the requirements for both clinical investigation and related basic studies. Special facilities are available for projects in the fields of experimental cardiovascular, gastrointestinal, renal and endocrine physiopathology. An adequately equipped isotope laboratory and a biochemical laboratory with technical staff are available to assist graduate students who wish to carry out research projects in these laboratories.

(3) Normally an M.D. will be considered an entrance requirement for the M.Sc. program but consideration will be given to suitable candidates holding an appro-

priate Bachelor of Science degree. Applicants for the Ph.D. program must be a medical graduate or hold a Master's degree.

(4) Requirements for the M.Sc. degree include preparation and defense of a thesis based on research performed by the candidate and all candidates must include some course work in the program, specified by their supervisory committee. The minimum residence requirement is a full calendar year of research.

(5) Requirements for the Ph.D. degree include preparation and defence of a thesis and successful completion of the course requirement as decided upon by the Department and the Faculty of Graduate Studies and Research.

(6) Candidates are encouraged and fully supported in application to major granting agencies for financial support. Limited funds are available in the Department of Surgery for the support of additional candidates.

(7) Inquiries should be directed to the Chairman of the Department of Surgery, Clinical Sciences Building.

204.80.2 GRADUATE COURSES

THES 000. *Thesis.*

SURG 500. *Experimental Surgery.* ★3 (Second Term, 0-0-3). Designed to introduce M.Sc. and Ph.D. candidates to basic experimental surgical procedures. Course will include: a) surgical anatomy of laboratory animals, b) basic surgical methods, c) selected methods in experimental surgery. Prerequisite: Consent of the Department.

SURG 510. *Neurophysiology.* ★3 (Second Term, 3-0-0). Growth, degeneration and regeneration in the nervous system. Prerequisite: Consent of the Department.

SURG 520. *Directed Reading in Biomedical Research.* ★3 (First Term, 3-0-0). Reading and study of problems and techniques in the biological sciences important to surgical research under the direction of one or more faculty members.

SURG 530. *Directed Reading in Biology and Medicine.* ★3 (either trm, 3-0-0). Reading and study of topics in biomedical research of relevance to the student's interest under direction of one or more faculty members.

SURG 600. *Research Seminar.* ★2 (0-1s-0). A weekly series of seminars on current research is held during both terms. Graduate students must attend and make two presentations in this series.

204.81 Zoology

204.81.1 THE DEGREES OF M.SC. AND PH.D.

(1) The Department of Zoology has facilities to educate students for the Master of Science and Doctor of Philosophy degrees.

(2) Particular emphasis is laid upon ecology, physiology, invertebrate zoology, vertebrate paleontology, parasitology and animal behavior. A reference collection of the invertebrate and vertebrate fauna of Alberta is housed in the Department. Electron microscope, histological, radio-biological and controlled environment facilities are available, as well as general laboratory and collecting equipment. Two biological stations in Alberta serve as headquarters for summer field work. The University of Alberta is a member of the Western Canadian Universities Marine Biological Society, and as such, makes use of the Bamfield Marine Station on Vancouver Island as a site for zoological research.

(3) Programs for graduate degrees in Zoology conform to the general regulations of the Faculty of Graduate Studies and Research. However, the department generally does not accept students with an overall grade point average of less than 7.0 in their undergraduate years at The University of Alberta, or an equivalent qualification from another institution.

(4) A student may be required to show proficiency in one or more languages other than English at the discretion of the supervisory committee.

(5) In the case of graduate students from other universities and for some graduates of The University of Alberta an oral qualifying examination will be required during the First Term.

(6) A number of assistantships for graduate students are available. Limited funds are also available for the support of research undertaken during the summer.

(7) All inquiries concerning registration and financial assistance should be directed to the Chairman of the Department of Zoology. Registration as a graduate student in Zoology is done in consultation with members of the Department.

204.81.2 UNDERGRADUATE COURSES

The following may be taken for graduate credit:

ZOOL 404. *Natural History of the Vertebrates of Alberta.* ★3 (Second Term, 3-0-3).

ZOOL 405. *Ichthyology.* ★3 (First Term, 3-0-3).

ZOOL 406. *Ornithology.* ★3 (First Term, 3-0-3).

ZOOL 408. *Mammalogy.* ★3 (Second Term, 3-0-3).

ZOOL 411. *Embryology.* ★3 (First Term, 3-0-3).

ZOOL 412. *Experimental Embryology.* ★3 (Second Term, 3-0-3).

ZOOL 421. *Mechanisms of Evolution.* ★3 (First Term, 3-0-0).

ZOOL 430. *Experimental Zoology.* ★3 (Second Term, 3-0-3).

ZOOL 435. *Principles of Zoological Systematics.* ★3 (Second Term, 3-1s-0).

ZOOL 441. *Comparative Animal Physiology I.* ★3 (First Term, 3-0-3).

ZOOL 442. *Comparative Animal Physiology II.* ★3 (Second Term, 3-0-3).

ZOOL 451. *Aquatic Invertebrates of Alberta.* ★3 (First Term, 3-0-3).

ZOOL 452. *Principles of Parasitism.* ★3 (First Term, 3-0-3).

ZOOL 453. *Protozoology.* ★3 (First Term, 3-0-3).

ZOOL 454. *Wildlife Parasitology.* ★3 (Second Term, 3-0-3).

ZOOL 460. *Marine Biology.* ★3 (Second Term, 3-0-3 plus 2 week field trip).

ZOOL 461. *Marine Biology.* ★3 (Second Term, 3-0-0).

ZOOL 462. *Animal Ecology.* ★3 (First Term, 0-0-6).

ZOOL 463. *Principles of Ecology.* ★3 (Second Term, 3-0-3).

ZOOL 464. *Limnology.* ★3 (First Term, 3-0-3).

ZOOL 466. *Boreal Ecology II.* ★3 (Second Term, 3-0-0).

ZOOL 467. *Wildlife Conservation.* ★3 (First Term, 3-0-3).

ZOOL 468. *Problems in Wildlife Conservation.* ★3 (Second Term, 0-3s-0).

ZOOL 472. *Animal Behavior I.* ★3 (First Term, 3-0-3/3).

ZOOL 474. *Animal Behavior II.* ★3 (Second Term, 0-1s-4).

ZOOL 482. *Comparative Vertebrate Histology.* ★3 (Second Term, 3-0-3).

NOTE: See also courses listed under Biology, § 204.8 and Marine Science, § 184.18 of the Faculty of Arts and Science calendar.

204.81.3 GRADUATE COURSES

THES 000. *Thesis.*

ZOOL 512. *Immunogenesis.* ★3 (Second Term, 3-0-0).

ZOOL 520. *Seminar in Zoology.* ★0 (0-1s-0).

ZOOL 529. *Special Problems in Zoology.* ★3 (either term, 3-0-0).

ZOOL 530. *Individual Study.* ★3 (either term, 3-0-0).

ZOOL 540. *Environmental Physiology.* ★3 (First Term, 3-0-0).

ZOOL 561. *Seminar in Advanced Animal Ecology.* ★3 (Second Term, 0-3s-0).

ZOOL 571. *Advanced Animal Behavior.* ★3 (Second Term, 3-0-0).

ZOOL 572. *Ecological Aspects of Behavior.* ★3 (First Term, 0-3s-0).

ZOOL 605. *Seminar in Fish Ecology and Systematics.* ★3 (Second Term, 0-3s-0).

ZOOL 642. *Seminar in Comparative Animal Physiology.* ★3 (Second Term, 0-2s-0).

ZOOL 643. *Advanced Comparative Animal Physiology.* ★3 (First Term, 3-0-0).

ZOOL 656. *Helminthology.* ★6 (0-6L-0).

ZOOL 663. *Seminar in Population Ecology.* ★3 (Second Term, 0-3s-0).

NOTE A: See also courses listed under § 204.8 / Biology.

NOTE B: A list of Paleontology courses and course descriptions may be found under § 204.61 / Paleontology.

NOTE C: See also Immunology courses listed under § 204.55.2 / Microbiology.

Faculty of Extension

215 INTRODUCTORY

215.1 Members of the Faculty

Dean
C. M. LOCKWOOD, M.B.A.
Associate Dean
R. R. FARYON, M.B.A., F.B.I.M.

Professors
D. D. BARRY, A.O.C.A.
D. D. CAMPBELL, Ph.D.
G. W. LAMBLE, Ph.D.
H. W. ROBERTS, Ph.D.
J. A. SHAW, M.Sc.
W. H. STEWART, Ph.D.
H. K. WOHLFARTH, M.F.A.

Associate Professors
J. M. McDONALD, M.S.W.
R. A. PEARCE, M.A.
H. G. SAVAGE, Dip. in Art
D. J. WEIDEMAN, M.B.A.
G. H. WRIGHT, B.A.

Assistant Professors
J. D. FORBES, Dip. in Art
E. C. LeSAGE, M.A.
A. R. SCHMIDT, Dip. in Fine Art

Extension Librarians
S. A. DUBRULE, B.L.S.
M. L. ENGLISH, M.L.S.

Administrative Officer
R. J. SMYTH, B.A.

ADDITIONAL MEMBERS OF FACULTY COUNCIL

President
M. HOROWITZ, Ed.D.

Representative of Radio and Television
W. H. JOPLING, B.Sc.Eng., Director

University Librarian
B. B. PEEL, M.A., B.L.S.

General Faculties Council Members
W. S. ADAMS, M.Sc., (Computing Science)
A. J. BALLAH, M.A., (Romance Languages)
R. S. JAMIESON, (Director, Boreal Institute for Northern Studies)
M. A. M. LAMBERT, M.A., (Home Economics)
E. D. MENDES, LL.B., (Law)
S. L. RICHARDSON, B. Sc.N., (Nursing)
T. A. PETERSEN, Ph.D., (Rural Economy)
J. D. WHITTAKER, Ph.D., (Mechanical Engineering)
S. E. WRIGHT, M.L.S., (Library Science)

Senate Members
H. DANIEL, Edmonton
E. FRIED, Edmonton
J. McLEAN, Edmonton
M. PASULA, Drayton Valley
D. USHER, Edmonton

Other Members
L. E. GANDER, LL.B., (Associate Professor, Legal Resource Centre)
G. R. KAYLER, M.L.S., (Librarian, Legal Resource Centre)
R. W. KINNEY, M.A., (Associate Professor, Faculty of Extension)
D. J. PAHULJE, M.L.S., (Librarian, Legal Resource Centre)
L. E. PAYNE, B.L.S., (Librarian, Extension Library)
M. J. RIDDLE, LL.B., (Assistant Professor, Legal Resource Centre)
S. S. SY, M.Sc., (Assistant Professor, Legal Resource Centre)
G. B. RESCHENTHALER, Ph.D., (Representative, Faculty of Business Administration and Commerce)
M. A. PRICE, Ph.D., (Chairman, Faculty of Agriculture and Forestry Extension Committee)
E. S. METATAWABIN, (Acting Advisor on Native Affairs)
A. G. KONRAD, Ph.D., (Representative, Faculty of Education)
J. ROEBUCK, (ACCESS Alberta)
Rev. H. ALSTON, (McDougall United Church)
J. F. FORREST, Ph.D., (Department of English)
H. VERDIN, (Financial Life Assurance Company of Canada)

215.2 General Information

The Faculty of Extension serves as a link between the University and its storehouse of information and expertise for people of the Province who need access to this information and these skills in order to solve practical problems and to further personal growth and personal interests.

In order to accomplish its task, the Faculty offers courses, seminars, and materials in various forms to members of the Provincial community in the areas of business, fine arts, the humanities, the professions, the sciences, and through the provision of books, films, tapes, and educational media equipment. Faculty members are also involved in consulting, training, and research in adult education.

Details of the programs and services offered by the Faculty are outlined below.

216.1 Extension Library

The Extension Library provides a service to residents of rural Alberta who have no public library in their communities. It has a book collection of over 80,000 volumes which provides intellectual, educational, recreation and leisure reading for its patrons. Books are sent by mail to individuals and families, and in boxes of twenty to small libraries and community groups. The Extension Library is also a major collecting centre for inter-library loan requests, and has access to the University's main library to support this function.

The Library supports Extension courses in a wide variety of subjects through its close co-operation with the Adult Student Centre in Corbett Hall.

216.2 Educational Media

An Audio-Visual Library containing some 4,500 16mm films, more than 4,100 recordings, and 2,800 audio cassettes is maintained. A variety of projectors and recording playback equipment is available as well.

An educational media reference file provides data on the nature, availability, and uses of various types of educational media, and, in addition, on developments in educational television and programmed learning. This reference service is also designed to meet the needs both of teachers and of a wide variety of community groups.

With the support of educational media facilities, the Faculty provides formal and informal courses in the principles and techniques of audiovisual communication in Edmonton and throughout the Province.

216.3 Adult Student Centre

The Adult Student Centre combines the resources of a media centre and a meeting place for small groups. The media includes books, journals, records, tapes, and filmstrips. Listening and viewing points for individual use of audio-visual materials are provided. Books and journals relate to the field of continuing education including adult counselling, teaching methods, community development, human resources development, and to broad areas covered by Extension courses.

The Centre is open to formal and informal groups for meetings as well as to Extension students and the general public.

Members of the public may borrow printed materials for a subscription of $2 per year. Extension students may borrow this material free of charge.

216.4 Public Administration Training

Certificate Courses in Local Government Studies and Public Administration Studies provide the necessary training required by administrators in the public sector. In addition, this segment of the Faculty is responsible for major conference courses held annually at Banff.

The needs of local government officers for special training are met through a combination of correspondence courses and tutorial sessions.

Federal and Provincial administrators are provided with evening or daytime lecture courses in the Public Administration Certificate Program. Since 1966, this curriculum has expanded to provide public administrators with a variety of courses addressing both theoretical and practical concerns of administration.

216.5 Fine Arts

Part-time and full-time instructors in painting, ceramics, drawing, photography, and printmaking offer a variety of courses in the fine arts at Edmonton. In addition, the Faculty conducts classes in drawing, painting, and composition at a number of centres throughout the Province. Instructors of national and international reputation are invited to Edmonton to offer intensive short courses in painting during the summer.

216.6 Liberal Studies

Liberal studies includes in its scope evening and daytime programs, short courses, seminars, and workshops in the humanities, languages, applied behavioral sciences, and public affairs. New course and program patterns to suit the circumstances of collective and independent adult learners, in conjunction with the Extension Library and Educational Media. Faculty in this area provide consultative and organizational service to other groups and institutions, urban and rural, engaged in or concerned with the liberal education of adults.

216.7 Community Resources Development

Programs are designed to mobilize the University's resources to assist Alberta's urban and rural communities to maximize the development of their human and physical resources. Towards this end, experiential training programs, conferences, workshops, and consultative services are offered in the areas of leadership development, agricultural technology, community development, urban studies, socio-economic development, and group dynamics.

Public issues including agricultural policy, social and economic development policy, and urban affairs are topics of study in many other programs.

A particular effort is being made to support the Provincial Government and native organizations in their efforts to improve the social and economic position of people of native ancestry.

The work of this section is carried out in close co operation with many public and volunteer organizations.

Publications prepared by the Faculty of Agriculture and Forestry and Plant Industry Division of Alberta Agriculture are distributed by this area of the Faculty.

216.8 Business and Professional Training

Business and professional continuing education provides opportunities for adults to refresh and update th knowledge they require to perform effectively in the

vocations. The main thrust of the work is in the area of management education and specialized programs of continuing education for various professional groups. This work is carried out through the initiating, developing, and offering of courses. The format for courses includes informal evening and day-time classes, seminars, and short courses — some residential in nature — based on new research. Courses are also offered which lead to University Certificates in Computers and Business Data Processing, Management Development, Personnel Administration, Employee Benefits Administration, and Real Estate. The staff consult with members of the business and professional community to ascertain their needs for continuing education. At the same time they work closely with other members of the University faculty to develop programs which will, in the most effective way, meet these needs.

216.9 Legal Resource Centre of Alberta

The Legal Resource Centre is a public legal education program funded by the Alberta Law Foundation. Features of the Centre include: training programs, consulting, a newsletter, radio programs, library, and a speaker's bureau. For information in any of these areas please call 432-5732.

Convocation ceremonies Spring 1980

Awards

221 INTRODUCTORY

221.1 *Administrator of Student Awards*

L. HENDERSON, B.A.

221.2 *General Information*

This calendar includes a list of awards of all kinds and of financial assistance available to students at The University of Alberta as shown in the Table of Contents.

Students of high ability or those who require financial assistance are urged to read carefully the sections of interest to them.

Application forms may be obtained from the Student Awards Office, and completed forms must be received by the Student Awards Office by the dates indicated in the various sections.

The University assumes liability for the payment of fellowships, scholarships, bursaries, prizes and other awards only to the extent that gifts from donors, or returns from particular investments for these purposes, will permit.

For information regarding assistance under the Provincial Students Finance Act or the Canada Student Loans Plan refer to the special sections in this calendar or inquire at the Student Awards Office, Room 252 Athabasca Hall.

As this calendar is published a considerable time before the opening of the Session, the University reserves the right to make whatever changes circumstances may require, including the cancellation of particular awards.

222 AWARDS OPEN TO ALL FACULTIES

222.1 *Matriculation Awards*

NOTE: Matriculation awards restricted to certain faculties are listed under those faculties in § 223. Please refer to the appropriate faculty section for these matriculation awards.

222.1.1 GENERAL INFORMATION

Unless otherwise stated in the terms of any award, these awards are tenable only at The University of Alberta, Edmonton. There are a few which are also tenable at colleges affiliated with the University.

Students entering first year of Faculté Saint-Jean are eligible for these awards and may apply on the University of Alberta Matriculation Scholarship application form, or may apply direct to any of the other donors as indicated.

In order that awards may be equitably distributed, no student may hold more than one major award in any one year. All monetary awards, except certain cash prizes, are contingent upon students proceeding with their university programs in the immediate next academic session and are payable only when students are in actual attendance at the University. Payment of fees is a first charge against such awards.

Completed application forms must be received as indicated in the terms of the various awards. Awards will be announced about September 1.

For scholarship purposes The University of Alberta will compute matriculation averages as follows:

The mark in English 30 and the best four other marks, at least *three* of which must be subjects from Group A (Humanities) and Group C (Sciences). The *fifth* subject may be from the Group B (Fine Arts) classification provided that it has a percentage mark and a weight of 5 credits.

The classification of subjects is as follows:

Group A (Humanities)
Social Studies 30
English 30
Language (other than English)
Second Language (other than English)
Social Sciences 30

Group B (Fine Arts)
Art 30
Art 31
Commercial Art 32
Drama 30
Music 30
Music 31
Performing Arts 32

Group C (Sciences)
Biology 30
Chemistry 30
Mathematics 30
Mathematics 31
Physics 30

222.1.2 LIST OF AWARDS

The Alberta Hotel Association Scholarships

Value: $400 or $700.
Number: 60.
Conditions: Awarded on the basis of academic standing and financial need. Amounts of $400 are intended for students living at home and $700 for those living away from home.
Where tenable: At any university in Alberta or at any college affiliated with such a university.

Apply: Application forms may be secured from the Alberta Hotel Association, 804 Empire Building, 10080 Jasper Avenue, Edmonton T5J 1Y9, or from the high school principal, and must be completed and returned by July 15.

Alberta 4-H Further Education Awards

Field of Study: Agriculture and Home Economics.
Value: Variable.
Number: Variable.
Conditions: There are a number of university entrance awards provided by donors such as the Alberta Wheat Pool, the Pennington Memorial Trustee, the Women of Unifarm, and the Canadian National Exhibition which are available to present or former 4-H members.
Apply: Application forms are available from Regional Representatives or the 4-H Branch, Alberta Agriculture.

The Alberta Wheat Pool Bursaries for Rural Students

Value: $600 per year for up to five undergraduate years.
Number: Four, one each in the following zones: Zone 1 — that part of Alberta north of the 49th parallel and including township 26, and that area of B.C. tributary to Creston; Zone 2 — that part of Alberta north of township 26 and including township 42; Zone 3 — that part of Alberta north of township 42 and including township 58; Zone 4 — that part of Alberta and B.C. Block north of township 58 to the 59th parallel.
Conditions: Offered to matriculants from Alberta high schools whose parents are actively engaged in farming. Basis of award will be matriculation standing and financial need. Preference will be given to applicants entering the Faculty of Agriculture or the Faculty of Home Economics. An average of 5.5 is required for renewal.
Where tenable: At any university in Alberta or affiliated college.
Apply: Administrator of Student Awards by July 15.

The Alma Mater Matriculation Bursaries

Value: $600.
Number: 3.
Conditions: Offered annually to students entering first year on the basis of high academic attainment. Financial need of the student is taken into consideration.
Donor: The Alma Mater Fund of The University of Alberta.
Apply: Administrator of Student Awards by July 15.

The Dr. Art Anderson Scholarship

Value: $250.
Conditions: Award will be based on the standing in the required subjects of Grade XII. The student must have attended Grade XII in that part of Alberta south of a line from Rocky Mountain House to Red Deer to Coronation but not including these centres.
Donor: The Calgary Pharmaceutical Society.
Apply: Administrator of Student Awards by July 15.

The Harry W. Bass Memorial Bursaries

Value: $700 each.
Number: 6.
Conditions: To be awarded to students entering first year at The University of Alberta, based on academic standing and financial need.
Donor: Endowed by the late Harry W. Bass of Dallas, Texas.
Apply: Administrator of Student Awards by July 15.

The Viscount Bennett Scholarships

Value: $850 each.
Number: 4.
Conditions: Open to students who have resided for at least five consecutive years in Calgary or within twenty miles of that city, or in Banff National Park. Awarded on the basis of academic attainment, good character and satisfactory personal qualities. Financial need may be taken into consideration.
Donor: From a trust created by the late Right Honourable Viscount Bennett, P.C., K.C., LL.D., D.C.L., of Calgary and Mickelham.
Apply: Administrator of Student Awards by July 15.

The Calgary Power Matriculation Scholarships

Value: $500.
Number: 5.
Conditions: Awarded annually to matriculating students entering first year at The University of Alberta whose homes are in areas served by Calgary Power Ltd., either directly or indirectly.
Donor: Calgary Power Ltd. in memory of G. H. Thompson, late Chairman of the Board of Calgary Power Ltd., and devoted friend of the University.
Apply: Administrator of Student Awards by July 15th.

The Canadian Foundation for Poliomyelitis and Rehabilitation (Alberta Chapter) Bursaries

Value: $300 each.
Number: 4.
Conditions: Awarded annually to applicants entering the first, second, third and fourth year of Rehabilitation Medicine. The basis of the award will be academic standing and financial need. It is expected that recipients will carry on their profession in Alberta for a reasonable period after graduation.
Donor: The Royal Canadian Legion.
Apply: Administrator of Student Awards — undergraduates by June 1 or matriculants by July 15.

The Canadian Mathematical Congress Scholarships

Value: $200 and $400.
Number: 2.
Conditions: These scholarships will be awarded to Canadian citizens or Permanent Residents (Landed Immigrants) who have taken all of their Grade XI work at an Alberta or North West Territories High School, have obtained satisfactory standing in this work (including Mathematics 30 and 31), and are entering the first year of any degree program at a University. The awards will be made primarily on the basis of the Alberta High School Prize Examination in Mathematics which is set and marked by the Universities at Edmonton and Calgary, and is written in the month of March.
Where tenable: Any Canadian university.
Apply: Candidates should apply directly to their principal, who will forward contestants' names to the co-ordinator of the Alberta High School Prize Examination in Mathematics, The University of Alberta, Edmonton, Alberta, by February 15th. The co-ordinator will then arrange for candidates to write the examination.

NOTE: The congress also administers the "Canadian Mathematical Olympiad" with 18 prizes ranging from

$100 to $1,500. Conditions are similar to the above and candidates should inquire of high school principals.

The Dr. K. A. Clark Memorial Bursary

Value: $600.
Conditions: To be awarded to a student from the area of Fort McMurray. The award will be based on academic standing and financial need. It may be awarded either to a matriculant entering the first year of The University of Alberta or to an undergraduate but with preference to the former.
Donor: The late Mrs. Dora Clark, in memory of her late husband, Dr. K. A. Clark.
Apply: Administrator of Student Awards by July 15 of the first year.

The Percy Clubine Memorial Bursaries

Value: $500 each.
Number: 3.
Conditions: Awarded annually on the basis of academic standing and financial need, to students entering first year Agriculture. The awards are conditional on a minimum Grade XII average of 70%.
Donor: Endowed by the late Hazel L. Clubine (through The Guaranty Trust Company of Canada).
Apply: Administrator of Student Awards by July 15.

The Walter A. Crawford Memorial Bursaries

Field of Study: Agriculture and Geology.
Value: $1,000 each.
Number: One in each of Agriculture and Geology.
Conditions: To be offered to two students entering first year at The University of Alberta; one in Agriculture and one in Geology. The awards will be based on academic standing and financial need.
Donor: Endowed through the will of the late Walter A. Crawford of Edmonton.
Apply: Administrator of Student Awards by July 15.

The John Edgar Memorial Bursaries in Fine Arts

Value: $350 each.
Number: 3.
Conditions: To be offered on the basis of academic standing and financial need to students entering first year in any of the fields of Fine Arts — Art and Design, Drama or Music.
Donor: Endowed through a bequest of the late John Edgar of Edmonton.
Apply: Selection will be made by the departments concerned.

The Edmonton Musical Club Scholarship in Music

Value: $650.
Conditions: To be awarded annually to a student from an Alberta High School, entering the first year of the Bachelor of Music program.
Donor: Endowed by the Edmonton Musical Club upon its dissolution in 1973.
Apply: Selection will be made by the Department of Music, either following the auditions for admission, or at the end of the first term of the first year.

The Edmonton Society of Pharmacists Scholarship

Value: $200.
Conditions: Awarded annually to a student of outstanding merit on the required Grade XII subjects. The student must have carried out the work of Grade XII in that part of Alberta north of a line from Rocky Mountain House to Red Deer to Coronation and including those centres.
Apply: Administrator of Student Awards by July 15.

The Edmonton Sportsman's Fund Bursary

Value: $500.
Conditions: To be offered annually to a student from an Edmonton high school entering first year of the Faculty of Physical Education and Recreation. The award will be based on academic standing, financial need and participation in athletics in high school.
Donor: The Edmonton Sportman's Fund Inc.
Apply: Administrator of Student Awards by July 15.

The Federated Pipe Lines Ltd. Scholarship

Value: $500 per year for up to four undergraduate years.
Conditions: Offered each even-numbered year to a student of outstanding merit entering first year. This scholarship is subject to renewal for three further years or until graduation, whichever is less, providing a satisfactory academic standing is maintained.
Apply: Administrator of Student Awards by July 15.

The Friends of the University Matriculation Bursaries.

Value: $500 each.
Number: 3.
Conditions: Offered to graduates of Alberta high schools, on the basis of matriculation standing and financial need.
Apply: Administrator of Student Awards by July 15.

The Dr. F. P. Galbraith Matriculation Bursaries

Value: Tuition and fees.
Number: 12.
Conditions: Offered annually to students entering first year on the basis of finanacial need and academic standing.
Donor: The Escheated Estates Fund of The University of Alberta in memory of the late Dr. F. P. Galbraith, Publisher of the *Red Deer Advocate* and Chancellor of The University of Alberta, 1964-1970.
Apply: Administrator of Student Awards by July 15.

The William Norman Grace Memorial Bursary

Value: $2,200.
Conditions: To be offered annually on the basis of academic standing and financial need, to a student who has been an Alberta resident for at least 12 months prior to application, and who is entering first year at The University of Alberta. Preference will be given to students entering the Faculty of Business Administration and Commerce.
Donor: Endowed anonymously.
Apply: Administrator of Student Awards by July 15.

The Hudson's Bay Oil and Gas Company Limited Bursary in Engineering

Value: $1,000 per year for four years.
Conditions: Awarded on the basis of scholastic achievement, personal qualities and character with due consideration to financial need. The applicant must state an intent to study engineering related to the petroleum industry. A new award will be made on the completion of the preceding one.
Apply: Administrator of Student Awards by July 15.

The Hudson's Bay Oil and Gas Company Limited Bursary in Geology

Value: $1,000 per year for four years.
Conditions: Awarded to the student entering first year in a program in Geology, on the basis of academic standing and financial need. A new award will be made on the completion of the preceding one.
Apply: Administrator of Student Awards by July 15.

The IODE Coronation Bursaries

Value: $650 each.
Number: 3.
Conditions: All candidates must have resided in the province of Alberta for at least three years prior to application.
Where tenable: Any university in Alberta or affiliated college.
Apply: Administrator of Student Awards by July 15.

The Moe Lieberman Scholarship

Value: $600.
Number: 1.
Conditions: Awarded annually to a student entering first year on the basis of scholastic ability and financial need. Consideration will be given to merit in football.
Donor: Edmonton Eskimo Football Club and Mr. M. E. Lieberman.
Apply: Administrator of Student Awards by July 15.

The Amelia Viola Lobb Memorial Bursary

Value: $400.
Conditions: To be offered annually to a student from an Alberta high school who will be entering first year of the Faculty of Education. The award will be based on academic standing and financial need.
Donor: Endowed through the will of the late Miss Lobb who taught for an extensive period of time in the Province of Alberta.
Apply: Administrator of Student Awards by July 15.

The MacEachran Memorial Bursary in Education

Value: $750.
Number: 2.
Conditions: To be offered on the basis of academic standing and financial need to a student from an Alberta high school entering first year of the Faculty of Education.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.
Apply: Administrator of Student Awards by July 15.

The Masonic Bursaries

Value: Up to $700 each.
Number: Variable.
Conditions: Open to students from Alberta high schools on the basis of academic standing and financial need. They may be renewed subject to satisfactory standing and continued financial need.
Where tenable: Any university in Alberta or affiliated college or any other university if the program is not available in Alberta.
Apply: Apply to the Grand Secretary, Grand Lodge of Alberta, AF and AM, 330-12 Avenue S.W., Calgary. Application forms for new awards or renewals must be completed and returned by April 30.

The Melcor Developments Limited Scholarships

Value: $350.
Conditions: Awarded on the basis of high scholastic standing from an Alberta high school and financial need.
Apply: Administrator of Student Awards by July 15.

The P.E.O. Memorial Prize

Value: $100.
Conditions: To be awarded to a student from an Alberta high school who will be entering the B.Sc. in Nursing program at The University of Alberta.
Donor: The Edmonton Chapters of the P.E.O. Sisterhood.
Apply: Administrator of Student Awards by July 15.

The Oil Service Charitable Organization Bursary

Value: $500.
Number: 2.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering first year of the Rehabilitation Medicine Program. Preference will be given to students from Alberta and Saskatchewan.
Donor: Endowed by the Oil Service Charitable organization (1964-1976).
Apply: Administrator of Student Awards by July 15.

The Peace River Pioneer Memorial Bursaries

Value: Variable up to a total of $7,500.
Number: Variable.
Conditions: Awarded to high school graduates whose homes lie north of township 68 and west of the 5th meridian in the Province of Alberta and who are proceeding into the first year of The University of Alberta or at any institution of university level affiliated with this University and located in the above area. Awards will be based on high academic standing and financial need.
Donor: Endowed by the late Mr. Charles Plavin of North Star, Alberta.
Apply: Administrator of Student Awards by July 15.

The Harvey S. Perkins Scholarships

Value: Tuition and Fees.
Number: Variable (about 25).
Conditions: Offered annually to students entering first year on the basis of high academic attainment. Financial need of the student is taken into consideration.
Donor: Estate of the late Beulah Hill Perkins.
Apply: Administrator of Student Awards by July 15.

The David Butchart Pope Scholarships

Value: $500.
Number: 3.
Conditions: Awarded annually on the basis of academic standing and financial need to three student entering the Faculty of Agriculture and Forestry. Preference will be given to rural students who are, or have been members of Boys' or Girls' Clubs.
Donor: The Estate of the late David Anderson Pope.
Apply: Administrator of Student Awards by July 15.

Province of Alberta Matriculation Scholarships

Value: $150 each.
Conditions: Available to bona fide residents of Alberta

who have achieved 80% or better on the required subjects from an Alberta high school.

Where tenable: In the first year at a university in Alberta or in a program of university level at a college affiliated with such a university, or at another approved college or university.

Donor: The Province of Alberta.

Apply: Students attending The University of Alberta should apply through the Student Awards Office of the University in September. Application must be on the special Provincial Government form for this purpose.

The Royal Canadian Legion Bursary

Value: $300.

Conditions: Awarded on the basis of scholastic ability and financial need, and according to the following priorities: (1) to a son or daughter of a member of the armed forces or merchant navy who lost his or her life during, or as a direct result of, hostilities in the War of 1939-45; or (2) to the son or daughter of a member of the said forces or merchant marine who was seriously incapacitated either physically or mentally; or, (3) to the son or daughter of any man or woman who served in any of His Majesty's or Allied forces during 1939-45. Failing the receipt of applications from the above-mentioned groups, consideration will be given to applicants from (4) sons or daughters of native or naturalized Canadians domiciled in Alberta.

Donor: Dominion Command of the Royal Canadian Legion B.E.S.L.

Apply: Administrator of Student Awards by July 15.

Robert David Sinclair Bursary

Value: $200.

Conditions: Open to students from high schools or schools of agriculture in Alberta and to be awarded on the basis of academic standing and financial need.

Donor: The family of the late Robert David Sinclair, former Dean of Agriculture.

Apply: Administrator of Student Awards by July 15.

The Suncor Scholarship

Value: $500.

Conditions: Offered annually to a student entering first year of the Faculty of Engineering at The University of Alberta. The award will be based on academic standing and financial need.

Donor: Suncor Inc., Calgary.

Apply: Administrator of Student Awards by July 15.

The Robert Tegler Matriculation Bursaries

Value: Tuition and fees for one year.

Number: 3.

Conditions: To be offered on the basis of high academic standing and financial need to students who are Canadian citizens, who have completed Grades X, XI and XII in Alberta, and at least Grade XII in an Edmonton high school.

Donor: The Tegler Foundation of Edmonton.

Apply: Administrator of Student Awards by July 15.

The Robert Tegler Special Bursaries

Value: Tuition and fees plus $300.

Number: 3.

Conditions: Available to physically handicapped students. While due weight will be given to the academic record of candidates, special consideration will be given to their background, financial need, nature of handicap, personal qualities, and other relevant points. The scholarship may be awarded to the same student a second time, or even throughout the whole undergraduate program. A medical certificate must be provided to the Student Awards Office.

Donor: The Tegler Foundation of Edmonton.

Apply: Administrator of Student Awards by July 15.

The Henry Marshall Tory Bursary

Value: $900.

Number: 1.

Conditions: Awarded annually to a Canadian Citizen or Permanent Resident (Landed Immigrant) entering any Faculty at The University of Alberta on the basis of satisfactory academic standing and financial need.

Donor: Endowed through the General Alumni Association of The University of Alberta in memory of the late Dr. Henry Marshall Tory, first President of The University of Alberta (1908-1928).

Apply: Administrator of Student Awards by July 15.

Trans Mountain Oil Pipe Line Company Scholarships

Field of Study: Engineering or the Physical Sciences.

Value: $300 each plus a grant-in-aid to the University.

Number: 4.

Conditions: Offered to students whose homes are along the route of the Trans Mountain Pipe Line in Alberta from Edmonton west to the provincial boundary. Preference will be given to students from outside the city of Edmonton. Financial need may be taken into consideration.

Apply: Administrator of Student Awards by July 15.

The University of Alberta Matriculation Bursaries

Value: Tuition and fees for one year.

Number: Variable.

Conditions: Open to students entering first year at The University of Alberta. The basis of the award will be academic standing and financial need.

Donor: The Escheated Estates Fund of The University of Alberta.

Apply: Administrator of Student Awards by July 15.

The University of Alberta Matriculation Prizes

Value: $100.

Number: Variable.

Conditions: To be awarded to students of outstanding academic merit entering first year and who have not received any other major award.

Donor: The Escheated Estates Fund of The University of Alberta.

Apply: Administrator of Student Awards by July 15.

The Mildred Rowe Weston Memorial Bursaries

Value: $600 each.

Number: Three.

Conditions: To be awarded annually on the basis of high academic standing and financial need to students from rural Alberta. Preference will be given to students having completed courses through the Alberta Correspondence School.

Donor: Endowed through the Will of the late Mildred Rowe Weston.

Apply: Administrator of Student Awards by July 15th.

The University Women's Club of Edmonton Scholarship

Value: $1,500, payable $900 entering first year and $600 on entering second year.

Conditions: Awarded annually, on the basis of high academic standing and financial need, to a woman student entering the first year of a degree program at The University of Alberta. The recipient must have achieved at least an 85% average on the required Grade XII examinations in Alberta and must achieve a grade point average of 6.5 for the second installment.
Donor: Endowed by the University Women's Club of Edmonton.
Apply: Administrator of Student Awards by July 15.

The Women's Committee of the Edmonton Symphony Society Matriculation Scholarship

Field of Study: Music.
Value: $400.
Conditions: Offered to a student entering the Bachelor of Music program with intent to major in orchestral instruments. Award will be based on academic standing and musical merit.
Apply: Selection will be made by the Department of Music.

222.2 *Undergraduate Awards*

222.2.1 GENERAL INFORMATION

Application forms for bursaries or for scholarships which require application, may be obtained from the Administrator of Student Awards. For undergraduates the due date for completed application forms in most cases is June 1. Where no application information is listed, the award is made automatically without application.

Normally, unless otherwise stated, these awards are based on a full normal load of academic work done only at this University. Where an award is listed in a particular faculty it is generally tenable in that faculty (except course prizes which are open to any full-time student in that course). In order that awards may be equitably distributed, no student may hold more than one major scholarship award in a given year.

Awards will be announced as they are made from May through to September.

Unless otherwise stated, monetary awards, except certain cash prizes, are contingent upon the student's proceeding with his, or her, university program in the immediate next academic session, and are payable only when the student is in actual attendance at the University. The payment of fees is a first charge against such awards.

The University assumes liability for the payment of scholarships, bursaries, prizes and other awards only to the extent that gifts from donors or returns from particular investments for these purposes will permit.

For matriculation awards refer to § 222.1 and the Matriculation awards listed under specific faculties in § 223.

For awards in graduate study refer to the Graduate Studies section of the Awards Calendar or the Graduate Studies and Research Calendar.

222.2.2 LIST OF AWARDS

The University of Alberta Undergraduate Bursaries

Value: Tuition and fees for the succeeding year.
Number: Variable.
Conditions: Open to students on the basis of academic standing and financial need in any Faculty and in any year, provided the student is returning in the immediate next academic session in a full-time undergraduate program.
Donor: The Escheated Estates Fund of The University of Alberta.
Apply: Administrator of Student Awards by June 1.

The University of Alberta Prizes for Affiliated Colleges

Value: $100.
Conditions: Offered to the student or students transferring from each of the affiliated colleges to The University of Alberta, who have the best academic average at the time of transfer from first to second year and/or the transfer from second to third year. The average must be based on a full normal academic load. Such students must be registered full-time in the immediate next session at The University of Alberta. In cases of equal standing full prizes will be paid to each.
Donor: The Escheated Estates Fund of The University of Alberta.

The University of Alberta Undergraduate Prizes

Value: $100.
Number: Variable.
Conditions: To be awarded in recognition of outstanding academic merit to students who have not received any other awards.
Donor: The Escheated Estates Fund of the University of Alberta.
Apply: Administrator of Student Awards by June 1.

Province of Alberta Undergraduate Scholarships

Value: $150 each.
Conditions: Available to undergraduate students who are bona fide residents of Alberta, on the basis of academic achievement in the previous year at an approved institution of university level provided that this shall be 80% (grade-point average 7.5) or better. The average will be computed on all courses taken during that year.
Where tenable: At any approved institution of university level.
Donor: The Province of Alberta.
Apply: Students attending The University of Alberta should apply to Administrator of Student Awards in September. Application must be made on the special Provincial Government form for that purpose.

The Robert Tegler Undergraduate Bursaries

Value: Tuition and fees for one year.
Number: 6.
Conditions: To be offered on the basis of academic standing and financial need to students in any year and any Faculty provided the recipient returns in the immediate next session as a full-time undergraduate student. Recipients must be Canadian citizens and have completed at least Grade XII of High School in Edmonton.
Donor: The Tegler Foundation of Edmonton.
Apply: Administrator of Student Awards by June 1.

The Robert Tegler Special Bursaries

Value: Tuition and fees plus $300.
Number: 3.
Conditions: Available to physically handicapped students. While due weight will be given to the academic record of candidates, special consideratio

will be given to their background, financial need, nature of handicap, personal qualities, and other relevant points. The scholarship may be awarded to the same student a second time, or even throughout the whole undergraduate program. A medical certificate must be supplied to the Student Awards Office.
Donor: The Tegler Foundation of Edmonton.
Apply: Administrator of Student Awards by July 15.

The Eugene Brody Scholarship

Value: Tuition and fees.
Number: 1.
Conditions: To be awarded to an undergraduate student on the basis of academic standing, financial need, and participation in extra-curricular activities of the University.
Donor: Escheated Estates Fund or The University of Alberta.
Apply: Administrator of Student Awards by June 1.

The City of Calgary Undergraduate Scholarships

Value: $500 each.
Number: 2.
Conditions: Offered annually to Calgary students entering second year at any approved university. Awarded on academic standing and financial need.
Apply: The City of Calgary Undergraduate Scholarship application forms are available at the Student Awards Office, The University of Calgary, or the Director of Finance, P.O. Box 2100, Calgary, and should be returned to Director of Finance, City of Calgary by July 15.

The Edmonton Ladies Quarterback Club Scholarship

Value: $600.
Number: 1.
Conditions: To be awarded annually to a student entering second or third year of an undergraduate program on the basis of academic standing and financial need. Applicants must have been a member of the University of Alberta Golden Bears football team or an Edmonton Junior football team.
Donor: Endowed by the Edmonton Ladies Quarterback Club.
Apply: Administrator of Student Awards by June 1.

The Federated Co-operatives Ltd. Bursary

Value: $375.
Conditions: Offered annually to an undergraduate student based on academic standing and financial need.
Apply: Administrator of Student Awards by June 1.

Dr. George V. Govier Prize in Energy Resource Conservation

Field of study: Any undergraduate degree program in Alberta.
Value: $1,000.
Number: 1.
Conditions: Awarded to an undergraduate student in his/her final year of study who submits an outstanding essay or report (5,000-7,000 words) on a significant management, environmental, or conservation aspect of the recovery or reproduction of fossil energy resources.
Donor: The Province of Alberta.
Apply: Dean of your faculty by February 10.

The IBM Canada Bursary Program

Value: A number of awards totalling $2,000 annually.
Number: Variable.
Conditions: Awarded to undergraduates who are in need and have a high academic standing.
Donor: International Business Machines Company Limited.
Apply: Administrator of Student Awards by June 1.

The India Community Prize

Value: $300.
Conditions: To be awarded annually to an undergraduate student of outstanding merit at the end of first year of any Faculty in the University. Financial need may be taken into consideration.
Donor: Endowed by the India Community in Alberta.
Apply: Administrator of Student Awards by June 1.

The Interprovincial Pipe Line Limited Bursaries

Value: A number of awards totalling $3,000 annually.
Number: Variable.
Conditions: Provided for undergraduates (Canadian or U.S. citizens in the Physical Sciences, Engineering, Business or Professional Faculties) having financial need and high academic standing.
Apply: Administrator of Student Awards by June 1.

The Samuel J. McCoppen Bursaries

Value: A number of awards totalling $7,000 annually.
Number: Variable.
Conditions: Awarded to undergraduates who are in need and have a high academic standing.
Donor: The will of the late Samuel J. McCoppen.
Apply: Administrator of Student Awards by June 1.

The Procter and Gamble Student Bursary Fund

Value: A number of awards totalling $2,100 annually.
Number: Variable.
Conditions: Awarded to undergraduates in Business Administration and Commerce, Engineering, Science or Liberal Arts, who are in financial need and have a high academic standing.
Apply: Administrator of Student Awards by June 1.

The German Academic Exchange Scholarship

Value: Tuition fees, partial travel costs, and living allowance for ten months beginning October 1.
Conditions: Applicants must be Canadian citizens, have a first degree by the date of tenure, not more than 32 years of age, and be sufficiently fluent in the German language.
Where tenable: At a German university or an academy of art or music.
Donor: The Federal Republic of Germany.
Apply: By letter to the Administrator of Student Awards by December 1. Letter should include academic background, study plans in Germany and projected plans after return.

Killam Exchange Scholarships with France

Number: 3.
Conditions: Each year the University of Alberta recommends to the Government of France three graduating students for positions as "Assistants" in either secondary or post-secondary French educational institutions. The students participate in this cultural exchange for nine months (October-June). The

rate of pay is about 2,300 NF per month and often lodging and meals can be obtained at a reduced rate. Proficiency in written and oral French is required. The applicant must be a Canadian citizen under 30 years of age and a resident of Alberta for the past five years.

Donor: The Killam General Endowment Fund and the Government of France.

Apply: Administrator of Student Awards by January 15.

The Hooper-Munroe Academic Award

Value: $100 each.

Number: 4.

Conditions: Offered annually to students graduating from The University of Alberta, with a Bachelor's degree for which the final requirements were completed by Summer Session. The awards will be made to those with the highest averages on the last five full-year courses (or equivalent) taken in Summer Sessions at The University of Alberta and counted towards the degree, provided that the grade point averages are not less than 7.0.

Donor: The Students' Union of Summer Session.

Donor: The Students' Union of Summer Session.

Apply: Selection is made from faculty records.

223 AWARDS BY FACULTY

223.1 *Introductory Note*

See Section 221.1.1 and Section 222.2.1 for General Information concerning matriculation and undergraduate awards.

223.2 *Faculty of Agriculture and Forestry*

223.2.1 MATRICULATION AWARDS

The Alberta Egg And Fowl Marketing Board Bursaries

Field of Study: Animal or Poultry Science.
Value: $500 each.
Number: Two.
Conditions: Awarded annually on the basis of high academic standing and financial need to two students entering first year Agriculture intending to major in Poultry or Animal Science.
Donor: The Alberta Egg and Fowl Marketing Board.
Apply: Administrator of Student Awards by July 15th.

Alberta 4-H Further Education Awards

Field of Study: Agriculture and Home Economics.
Value: Variable.
Number: Variable.
Conditions: There are a number of university entrance awards provided by donors such as the Alberta Wheat Pool, the Pennington Memorial Trustee, the Women of Unifarm, and the Canadian National Exhibition which are available to present or former 4-H members.
Apply: Application forms are available from Regional or the Local District Agricultural Office.

The Percy Clubine Memorial Bursaries

Value: $500 each.
Number: 3.
Conditions: Awarded annually on the basis of academic standing and financial need, to students entering first year Agriculture. The awards are conditional on a minimum Grade XII average of 70%.
Donor: Endowed by the late Hazel L. Clubine (through The Guaranty Trust Company of Canada).
Apply: Administrator of Student Awards by July 15.

The Walter A. Crawford Memorial Bursaries

Field of study: Agriculture and Geology.
Value: $1,000 each.
Number: One in each of Agriculture and Geology.
Conditions: To be offered to two students entering first year at The University of Alberta; one in Agriculture and one in Geology. The awards will be based on academic standing and financial need.
Donor: Endowed through the will of the late Walter A. Crawford of Edmonton.
Apply: Administrator of Student Awards by July 15.

The David Butchart Pope Scholarships

Value: $500 each.
Number: 3.
Conditions: Awarded annually on the basis of academic standing and financial need to three students entering the Faculty of Agriculture and Forestry. Preference will be given to rural students who are, or have been, members of Boys' or Girls' Clubs.
Donor: The Estate of the late David Anderson Pope.
Apply: Administrator of Student Awards by July 15.

Robert David Sinclair Bursary

Value: $200.
Conditions: Open to students from high schools or schools of agriculture in Alberta and to be awarded on the basis of academic standing and financial need.
Donor: The family of the late Robert David Sinclair, former Dean of Agriculture.
Apply: Administrator of Student Awards by July 15.

223.2.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Alberta Institute of Agrologists Gold Medal

Conditions: Awarded to a graduating student primarily on the basis of academic standing for the final two years in the B.Sc. Agriculture program which must be not less than 7.0. Consideration may be given to qualities of leadership, personality, and character.

The APEGGA Gold Medal in Agricultural Engineering

Number: One.
Conditions: Awarded to a student graduating from the Agricultural Engineering program. The basis for selection will be the academic record of the third and fourth years combined, which must be a grade point average of not less than 7.0. The right is reserved to withhold the awarding of the medal.
Donor: The Association of Professional Engineers, Geologists, and Geophysicists of Alberta.

The Canadian Institute of Forestry Medal

Field of study: Forestry.
Conditions: Awarded to a graduating Forestry student on the basis of an outstanding record of scholarship, citizenship, leadership, and participation in student activities throughout all years of the Forestry program.

The Frank A. Coates Memorial Prize

Field of study: Horticulture.
Value: $350.
Conditions: Awarded annually to a student of outstanding merit graduating from the Faculty of Agriculture and Forestry who has specialized in Horticulture. Preference will be given to a student from a rural home.
Donor: Endowed by Mrs. D. Enilda Peers in memory of her father.

The Commonwealth Forestry Bureau Prize

Field of study: Forestry
Value: A one-year subscription to "Forestry Abstracts" plus a certificate.
Number: 1.
Conditions: To be awarded annually on the basis of academic standing and potential research interests to a graduating Forestry student.
Donor: The Commonwealth Forestry Bureau, England.

Forest Biology Book Prize

Field of study: Forest Biology
Value: Book Award.
Number: 1.
Conditions: To be awarded to an outstanding graduating Forestry student on the basis of interest, ability, and aptitude in research and scholarship in an area of forest biology. The book will be selected by the Chairman of the Department of Forest Science.
Donor: Anonymous.

The Western Canadian Society for Horticulture Medal

Field of study: Horticulture.
Value: Medal and a five-year membership in the Society.
Conditions: Awarded annually to a student of outstanding merit graduating from the Department of Plant Science who has specialized in Horticulture. A gold medal will be given if 7.5 is achieved in the final year or a silver medal if 6.5 or better.

The Alberta Egg and Fowl Marketing Board Bursary

Field of Study: Animal or Poultry Science.
Value: 1,000.
Number: One.
Conditions: To be awarded on the basis of high academic standing and financial need to a student entering fourth year of the B.Sc. Agriculture program who is majoring in Animal or Poultry Science.
Donor: The Alberta Egg and Fowl Marketing Board.
Apply: Administrator of Student Awards by June 1st.

Alberta Forest Service Scholarship

Field of study: Forestry.
Value: $500.
Number: 1.
Conditions: Awarded to a student entering the fourth year of the B.Sc. Forestry program based on academic attainment and personal qualities. Preference will be given to a student whose interests lie in integrated resource management.
Donor: Province of Alberta, Department of Energy and Natural Resources.
Apply: By nomination of Department.

The Alberta Horticultural Association Prize

Field of study: Horticulture.
Value: $200.
Conditions: Awarded annually to a student of outstanding merit entering the third or fourth years of Plant Science and specializing in Horticulture.

The Alberta Institute of Agrologists Scholarship

Value: $600.
Conditions: To be awarded to the student with the highest academic standing completing second year in a program leading to a B.Sc. in Agriculture and proceeding to third year and who does not already have another award of equal or greater value.

The Alberta Poultry Industry Council Scholarship

Field of study: Poultry Science.
Value: $500.
Conditions: Offered to a student entering third year of Animal Science who will be specializing in the study of poultry. The award will be based on the academic work of the first two years in the Faculty (a grade point average of at least 6.0). If no suitable candidate is available, the award may be renewed to the same student for the fourth year.

The Canadian Forestry Equipment Spring Camp Prize

Field of study: Forest Science.
Value: $75 each.
Number: 2.
Conditions: Offered annually to students attending Spring Camp (Forestry 301), based on submission of the best reports for the Final Land Use Planning exercise. Selection will be made by the Camp Director, in consultation with staff involved with Spring Camp. Recipients of the award need not be members of the same team.
Donor: Canadian Forestry Equipment Limited, Edmonton, Alberta.

The Dan Baker Bursaries

Value: $700 each.
Number: 2.
Conditions: Offered to two students entering second, third or fourth year of the Faculty of Agriculture and Forestry on the basis of academic standing, financial need and personal character.
Donor: Endowed by the late Dan Baker of Edmonton.
Apply: Administrator of Student Awards by June 1.

The Eric R. Berg Memorial Award

Value: $200.
Conditions: To be awarded to a student entering second, third or fourth year in the B.Sc. Agriculture program. The award will be based on previous academic work and extracurricular activities, especially those related to the Faculty. Financial need may be taken into consideration. The Agriculture Club will be consulted in the selection.
Donor: The Agriculture Club in memory of the late Dr. E. R. Berg, a member of the Faculty from 1962-1969.

The Board of Governors Prizes in Agriculture and Forestry

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Canada Packers (Shur-Gain Division) Scholarship

Value: $500.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering fourth year of the B.Sc. Agriculture program with a preference for one who is majoring in a field of general interest to the livestock and feed industries.
Apply: Administrator of Student Awards by June 1.

The Canadian Feed Industry Association (Alberta Division) Scholarship

Field of study: Animal Science.
Value: $500.
Conditions: Offered to a student entering third year of Animal Science with a special interest in nutrition and based on the student's record in second year Agriculture.

Canadian Food Industry Scholarships

Field of study: Food Science.
Value: $1,000 each.
Number: 25 or more for Canada.
Conditions: To be offered to students who are Canadian residents and who will be entering second, third or fourth year of a Food Science program at an approved university (including The University of Alberta). Awards will be based on academic standing with credit for related experience such as summer employment in the food and beverage industry. Application for renewal may be made.
Where tenable: At any Canadian university offering an approved program.
Donor: The Federal Department of Industry and Canadian companies in the food industry.
Apply: To Chairman, Department of Food Science by May 1.

The Canadian Society of Animal Science Book Prize

Field of study: Animal Science and Poultry Science.
Value: $50.
Conditions: To be awarded annually for outstanding merit to a student who is entering the final year of study of Animal and Poultry Science.
Donor: The Canadian Society of Animal Science, 151 Slater Street, Ottawa, Ontario K1P 5H4.

Canadian Wheat Board Awards

Value: $2,000 each in third year; $2,500 each in fourth year.
Number: 4 in each year.
Conditions: To be awarded to students who will be entering third or fourth year in a program leading to a B.Sc. in Agriculture and who have completed one full year of academic study at a Canadian university. The awards, primarily based on academic standing, will be made to third and fourth-year students who are majoring in fields related to grain production and marketing. A student who receives an award in the third year of study will normally receive an award in the fourth year provided a 'high level of academic achievement' is maintained.
Donor: The Canadian Wheat Board. Apply: Dean of Agriculture and Forestry by March 1.

The Percy Clubine Memorial Bursaries

Value: $500 each.
Number: 3.
Conditions: Offered annually to students completing first, second or third years in the Faculty of Agriculture and Forestry, on the basis of academic standing and financial need.
Donor: Endowed by the late Hazel L. Clubine (through The Guaranty Trust Company of Canada).
Apply: Administrator of Student Awards by June 1.

The Entomological Society of Alberta Prize

Value: $110.
Conditions: Offered to the student in any of the first three undergraduate years obtaining a high standing in one or more courses in Entomology. The award is conditional on a satisfactory general record. This prize is open to any full-time student of any Faculty.

The Claude Gallinger Memorial Scholarship

Field of study: Animal Science.
Value: $500.
Conditions: Offered annually, on the basis of academic standing and financial need, to a student entering third or fourth years in the Department of Animal Science. Preference may be given to a married student.
Donor: Endowed by Miss Margaret Gallinger.
Apply: Administrator of Student Awards by June 1.

The David Angus Graham Memorial Scholarship

Field of Study: Silviculture.
Value: About $150.
Number: One.
Conditions: Awarded to a fourth year student in the Forestry program in recognition of high academic achievement in silviculture and related subjects. The recipient must have demonstrated interest in reforestation, shown evidence of concern for humanitarian principles and interest in fellow students, and shown promise for examplary professional development.
Donor: Relatives, friends and foresters of the late David Angus Graham.
Apply: By nomination of Department in consultation with Forest Society.

The Dr. T. W. Grindley Memorial Bursary

Value: $500.
Conditions: To be awarded annually on the basis of academic standing and financial need, to a student completing third year of the B.Sc. in Agriculture program, and proceeding into fourth year in the next following academic year.
Donor: Endowed in 1973 by Mrs. Dorothy J. Grindley of Edmonton, in memory of her late husband who obtained his B.A. in 1923 and B.Sc. in Agriculture in 1925 from this University and who devoted his career to the benefit of Agriculture in Western Canada.
Apply: Administrator of Student Awards by June 1.

The Herbert and Jeanette Hall Scholarships in Forestry

Field of study: Forestry.
Value: Tuition and fees.
Number: 4.
Conditions: Offered annually to a student who will be entering each of the second, third and fourth years in Forestry. The basis of award is academic merit and financial need. Preference may be given to students born in Alberta.
Donor: Endowed by the late Herbert and Jeanette Hall.
Apply: By nomination of the Department of Forest Science.

The Douglas Farquhar Johnston Bursaries in Agriculture

Field of study: Animal Science.
Value: $1,000 each.
Number: 5.
Conditions: Offered annually to three students entering third or fourth year of the Faculty of Agriculture and Forestry based on academic standing and financial need. Preference will be given to students in Animal Science.
Donor: Endowed by the late Mr. D. F. Johnston
Apply: Administrator of Student Awards by June 1.

The Ketchum Prize in Animal Science

Value: $250.
Conditions: Awarded to a student of outstanding merit and financial need completing the third year in the Department of Animal Science.
Donor: Ketchum Manufacturing Co. Limited of Ottawa.

The N. A. Larsen Memorial Scholarship

Field of study: Food Science.
Value: $500.
Conditions: Offered annually to a student entering third or fourth year in a Food Science program including Food Chemistry, Food Microbiology and Food Technology with preference being given to a student specializing in Food Technology. The award will be based on scholastic attainment during the years preceding the award and financial need.
Donor: The Estate of the late Mr. Larsen and the Central Alberta Dairy Pool.
Apply: Administrator of Student Awards by June 1.

The North Canadian Forest Industries Bursary in Forestry

Value: Tuition and fees.
Conditions: To be awarded to a student entering second, third or fourth year of the B.Sc. Forest Science program, on the basis of academic standing and financial need, provided a grade point average of at least 6.5 was achieved in the immediate previous year. The award will not be made if there are no suitable candidates in any one year.
Donor: North Canadian Forest Industries Limited, Grande Prairie, Alberta.
Apply: Administrator of Student Awards by June 1.

The Renkenberger Scholarship

Field of study: Agriculture and Forestry, Arts, Science, Education or Business Administration and Commerce.
Value: $250.
Conditions: Awarded to an undergraduate student who is especially interested in co-operative marketing. Basis of the award will be academic standing and participation in relevant extra-curricular activities.
Donor: Bequest of the late Harvey Renkenberger of Barons, Alberta.
Apply: Administrator of Student Awards by June 1.

The J. MacGregor Smith Scholarship

Value: $1,000.
Conditions: Offered annually on the basis of academic standing and financial need to a student in the Department of Agricultural Engineering.
Donor: Endowed by the late Mrs. Smith.
Apply: Administrator of Student Awards by June 1.

The Stetson Scholarships in Agriculture and Engineering

Field of study: Agriculture (excluding Forestry) and Engineering
Value: 3,000.
Number: Two — one award in Agriculture, and one award in Engineering.
Conditions: Awarded annually on the basis of academic attainment and financial need to students entering the third or fourth year of their program. Applicants must have been residents of Alberta for the previous five years.
Donor: The Scholarship was funded in recognition of the contribution made by Minot and Rosamond Stetson in the areas of agriculture and education in this province.
Apply: Administrator of Student Awards by June 1.

Wajax Fire Control Technical Report Award

Field of study: Forest Science.
Wajax Limited will award cash prizes for the three most suitable reports written as part of undergraduate curriculum requirements in the field of forest fire control, management and / or use.
First — $1,000.
Second — $500.
Third — $250.
The report is to be 1,500 — 3,000 words, in French or English, using either the editorial format required by the University or the *Canadian Journal of Forest Research.*
One report to be selected by each Canadian forestry school and forwarded to Wajax Limited by January 31, 1980 for judging by an independent three man committee.
The report must be written during the previous calendar year as part of undergraduate curriculum requirements. Graduating thesis will not be accepted. The competition is limited to students enrolled in an undergraduate forestry degree program.

The Western Co-operative Fertilizers Limited Scholarship

Field of study: Soil Science.
Value: $500.
Conditions: Offered annually on the basis of academic standing and financial need to a Canadian student entering third or fourth year in the Department of Soil Science.
Apply: Administrator of Student Awards by June 1.

The W. R. Zeidler Memorial Scholarship

Field of study: Forestry.
Value: $500.
Number: 3.
Conditions: Awarded annually to a student of outstanding merit who will be entering each of the second, third and fourth years in Forestry. The basis of the award is academic standing and financial need. Preference will be given to students from Northern Alberta. Successful students may also be given the opportunity for summer employment in the W. R. Zeidler Forestry Operations.
Donor: Zeidler Forest Industries Ltd.

223.3.1 MATRICULATION AWARDS

The John Edgar Memorial Bursaries in Fine Arts

Value: $350 each.
Number: 3.
Conditions: To be offered on the basis of academic standing and financial need to students entering first year in any of the fields of Fine Arts — Art and Design, Drama or Music.
Donor: Endowed through a bequest of the late John Edgar of Edmonton.
Apply: Selection will be made by the departments concerned.

The Edmonton Musical Club Scholarship in Music

Value: $650.
Conditions: To be awarded annually to a student from an Alberta High School, entering the first year of the Bachelor of Music program.
Donor: Endowed by the Edmonton Musical Club upon its dissolution in 1973.
Apply: Selection will be made by the Department of Music, either following the auditions for admission, or at the end of the first term of the first year.

The Women's Committee of the Edmonton Symphony Society Matriculation Scholarship

Field of study: Music.
Value: $400.
Conditions: Offered to a student entering the Bachelor of Music program with intent to major in orchestral instruments. Award will be based on academic standing and musical merit.
Apply: Selection will be made by the Department of Music.

223.3.2 UNDERGRADUATE AWARDS

NOTE: Awards open to all students in the Faculty of Arts are listed under General Awards. Gold medals and awards to graduating students are listed first. All other awards are listed alphabeticaly.

Awards in particular Arts subjects are listed by subject. They are open to students from any faculty registered in the relevant course.

GENERAL AWARDS

The Governor General's Gold Medal

Conditions: Awarded to the graduating student from an honors program in the Faculty of Arts who has shown the highest distinction in scholarship.
Donor: His Exellency, the Governor General.

The Dr. John Macdonald Gold Medal in Arts

Conditions: Awarded annually to the graduating student from the general program in the Faculty of Arts who has shown the highest distinction in scholarship.
Donor: Endowed by Professor Douglas E. Smith in memory of his late colleague, a former Head of the Department of Philosophy and Psychology and Dean of Arts and Science.

The Douglas E. Smith Gold Medal in Arts

Number: 1.
Conditions: Awarded annually to the graduating student from the B.A. (Special) program who has shown the highest distinction in scholarship.
Donor: The Faculty of Arts.

The Faculty of Arts Honors Prize

Value: $100 each.
Conditions: To be awarded to each graduating student in the Honors Program whose GPA on the total four-year program (being 8.0 or above) is within one decimal point of the GPA of the winner of the Governor General's Gold Medal.
Donor: The Faculty of Arts.

The Alberta Womens Bureau "Persons Case" Scholarship Fund

Field of study: Social Sciences.
Value: Variable.
Number: Variable.
Conditions: To be awarded annually on the basis of academic standing and the applicants personal financial situation to undergraduate students enrolled in Social Science programs who have placed an emphasis on human relationships, including the comparative history and overview of roles, images and ideologies as they apply to human behaviour, sex role relationships, minority groups and organizational theory and behaviour, in their programs.
Where tenable: Alberta universities.
Donor: The Province of Alberta provides up to $20,000 annually to the Fund.
Apply: Administrator of Student Awards by June 15.

The Board of Governors Prizes in Arts

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award. Students in a graduating year of a program are not eligible.
Donor: The Escheated Estates Fund of The University of Alberta.

The Mary Cameron Douglas Memorial Scholarship

Value: $700.
Number: 2.
Conditions: Awarded on the basis of outstanding merit and financial need to a student who is entering fourth year honors in the Faculty of Arts.
Donor: Endowed by the late James McCrie Douglas of Edmonton.
Apply: Administrator of Student Awards by June 1.

The Earl of St. Andrews chapter Prize in Fine Arts

Field of Study: Art and Design, Drama, Music.
Value: $300.
Number: One.
Conditions: To be awarded annually on the basis of high academic attainment to an undergraduate student in a Fine Arts degree program.
Donor: The Earl of St. Andrews Chapter of the I.O.D.E.
Apply: Administrator of Student Awards by June 1st.

The Queen Elizabeth Scholarships in Canadian Studies

Field of Study: Canadian Studies.
Value: $1,000.
Number: 10.
Conditions: To be awarded annually to outstanding students who are entering their final year of any program with a major emphasis on Canadian society and culture, provided their academic records are otherwise satisfactory in the year of the award. Selection to be based on the number (minimum three full courses), variety and grade point average of Canadian content courses, at least two of which must be in the students' area of specialization. In order to be eligible for this scholarship a student must be a permanent resident of Canada and have been enrolled at a post-secondary institution in Alberta during the year immediately preceding the year for which the scholarship is to be awarded.
Donor: The Province of Alberta in recognition of the visit paid to the Province of Alberta in 1978 by Queen Elizabeth.
Apply: Chairman, Canadian Studies Committee (For the advice of students wishing to qualify for this award, information on the Canadian Studies program, and course offerings in Canadian Studies, may be obtained from the Canadian Studies Office or from the Student Programs Office of the Faculty of Arts, 6th Floor Humanities Centre).

The Edmonton Section of the Council of Jewish Women Prize

Value: $100.
Conditions: Awarded to a student of outstanding merit completing the second year of an honors program, provided a grade point average of at least 7.0 is obtained.

The John Mills Imrie Memorial Bursary

Value: $750.
Conditions: To be offered annually, on the basis of academic standing and financial need, to a student completing the first year of the Faculty of Arts.
Donor: Endowed for a period of 10 years, beginning in 1973, by Mrs. Imrie and her daughter.
Apply: Administrator of Student Awards by June 1.

The F. T. Jenner Memorial Prize in Canadian Studies

Field of study: Canadian Studies.
Value: Variable, to a total of $1,300.
Number: 1 or more.
Conditions: To be awarded annually to students in the Canadian Studies program on the basis of academic merit, for further study of Canadian topics. The selection committee may also consider personal qualities which offer particular promise.
Where tenable: Any Canadian University.
Donor: Family & friends of the late F.T. Jenner. Selection will be made by Arts Faculty Standing Committee on Canadian Studies.

The Dr. Geneva Misener Memorial Scholarship in Modern Languages

Field of study: Modern Languages.
Value: $600.
Number: 1.
Conditions: To be awarded to a student of outstanding academic merit completing the third year of an honors program in Modern Languages.
Donor: Bequest of the late Dr. Misener.

The Petro-Canada Scholarship in Fine Arts

Field of study: Art and Design, Drama, or Music.
Value: $500.
Number: 1.
Conditions: Awarded annually on the basis of academic attainment to an undergraduate student in a Fine Arts degree program. Candidate must be a Canadian citizen who has resided in any of the four Western Provinces for the preceding two years. There is also the possibility of summer employment with Petro-Canada.
Donor: Petro-Canada.
Apply: Administrator of Student Awards by June 1.

The President's Scholarships

Field of study: Arts, Science and Law.
Value: $1,500 each.
Number: 3, one in each of above Faculties.
Conditions: To be offered on the basis of high academic standing and financial need.
Donor: Endowed in 1943 by the late Mr. Justice H. H. Parlee.
Apply: Administrator of Student Awards by June 1.

The Renkenberger Scholarship

Field of study: Agriculture and Forestry, Arts, Science, Education or Business Administration and Commerce.
Value: $250.
Conditions: Awarded to an undergraduate student who is especially interested in co-operative marketing. Basis of the award will be academic standing and participation in relevant extracurricular activities.
Donor: Bequest of the late Harvey Renkenberger of Barons, Alberta
Apply: Administrator of Student Awards by June 1.

The Frederick A. Scherrer Bursaries

Field of study: Arts and Science.
Value: $800 each.
Number: 4, two in each of the above Faculties.
Conditions: To be offered on the basis of academic standing and financial need.
Donor: Endowed by the late Dr. F. A. Scherrer.
Apply: Administrator of Student Awards by June 1.

The Sunwapta Broadcasting Limited Scholarship

Field of study: Communications as related to the Broadcasting and Television Industry.
Value: $200.
Conditions: Open to students entering fourth year Electrical Engineering or Honors Physics, or entering third or fourth years in Arts who have an interest in journalism or script writing.
Donor: Dr. G. R. A. Rice.
Apply: Administrator of Student Awards by June 1.

The Sheila Watson B.A. (Special) Prize in Canadian and/or Commonwealth Literature

Field of study: Canadian and/or Commonwealth Literature.
Value: $100.
Conditions: Awarded annually to an outstanding undergraduate student entering the final year of a B.A. (Special) degree in English and/or Canadian Studies, provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made. (Undergraduate students taking for credit

one-and-a-half full-year courses, or equivalent, from among the following will be eligible: English 364, 367, 369, 370, 371, 374, 384, and appropriate 400-level English courses.)
Donor: The editors of and contributors to *Figures in a Ground: Canadian Essays on Modern Literature Collected in Honour of Sheila Watson* (Saskatoon: Western Producer Prairie Books, 1978).

ART AND DESIGN

The Heinz-Jordan Memorial Scholarship

Value: $500.
Number: 1.
Conditions: Offered annually to a B.F.A. or M.F.A. student for excellence in any of the fields of specialization offered by the Department of Art and Design.
Donor: Heinz-Jordan Company.

The Brian Murchison Drawing Prize

Value: $75.
Number: 1.
Conditions: Awarded annually to a student in the B.F.A. program for outstanding achievement in the field of drawing.
Donor: Friends of the late Brian Murchison, a former student.

The University of Alberta Alumni Prize in Fine Arts

Value: $100.
Conditions: Offered annually to the student in the B.A. in Art or B.F.A. program who has demonstrated the best progress. Financial need may be considered in making the award.
Donor: General Alumni Association, The University of Alberta.

CLASSICS

The Monica Jones Aamodt Prize in Classics

Value: $140.
Conditions: Awarded to the student obtaining the highest standing in Classics 367 and 368, provided that standing obtained meets with the approval of the Faculty Council.
Donor: Endowed by the Delta Delta Delta Alumnae, in honor of Mrs. Monica Jones Aamodt, the organizer of the fraternity on this campus.

The Emily Sereth Lieberman Memorial Scholarship in Classics

Value: $600.
Conditions: Awarded to the student obtaining the highest standing in Classics 359 and 360, provided the student's record is otherwise satisfactory.
Donor: Endowed by the family and friends of the late Mrs. Lieberman.

The Dr. Geneva Misener Memorial Scholarship in Classics

Field of study: Classics.
Value: $600.
Number: 1.
Conditions: To be awarded to a student of outstanding academic merit completing the third year of an honors program in Classics.
Donor: Bequest of the late Dr. Misener.

DRAMA

The Citadel Theatre Award

Value: Two season subscriptions to the Citadel Theatre.
Conditions: Awarded annually to an outstanding student in Drama. If there is no suitable candidate no award will be made.
Donor: The Citadel Theatre of Edmonton.

The Friends of the Theatre Bursary

Value: Variable.
Number: Variable.
Conditions: Available to students entering second, third or fourth year of the Bachelor of Fine Arts in Drama program on the basis of academic standing and financial need.

The Sandra Faye Guberman Memorial Scholarship

Field of Study: Acting.
Value: $200.
Number: One.
Conditions: To be awarded annually to an outstanding student entering the final year of the B.F.A. Acting Program. Selection will be made by the B.F.A. Acting Committee on the basis of high academic achievement in the core courses.
Where Tenable: University of Alberta.
Donor: Friends of the Late Sandra Guberman.

The Elizabeth Sterling Haynes Scholarship

Value: $550.
Number: 1.
Conditions: To be awarded annually to a student entering second, third or fourth year of the Bachelor of Fine Arts in Acting or Design on the basis of academic attainment, artistic or professional achievement, and contribution and achievement above and beyond class and assigned work.
Donor: Endowed by Friends of Elizabeth Sterling Haynes.
Apply: Chairman, Department of Drama by May 1.

The Aaron Lazerson Memorial Prize in Drama

Value: $200.
Number: 1.
Conditions: To be awarded annually to a student entering the fourth year of a B.A. program, majoring in Drama, on the basis of excellence and commitment to the field of drama. A minimum grade point average of 7.0 is required.
Donor: Dr. & Mrs. H. Kreisel of Edmonton.
Apply: Chairman, Department of Drama by May 1.

The Joseph H. Shoctor Prize in Drama

Value: $250.
Conditions: To be awarded annually to a student entering the fourth year of the Bachelor of Fine Arts in Drama program, on the basis of academic standing.
Donor: Mr. Joseph H. Shoctor, Q.C., of Edmonton.

ECONOMICS

The Duncan Alexander MacGibbon Gold Medal in Economics

Conditions: Awarded annually to the student graduating with highest distinction from Honors Economics.
Donor: Endowed by the late Dr. D. A. MacGibbon of Hamilton, Ontario.

The Archibald Forster McGoun Memorial Book Prize in Economics

Value: $100.
Number: 1.
Conditions: To be awarded annually to the student obtaining the highest academic standing in Economics 403 or Economics 501, History of Economic Thought.
Donor: Mrs. M. H. Long of Edmonton.

ENGLISH

The Rutherford Memorial Gold Medal in English

Conditions: Offered to a student of outstanding merit graduating from the Honors English program, with at least first class standing.
Donor: Mrs. Cecil Rutherford, Edmonton, in memory of the late Honorable Alexander Cameron Rutherford.

The Aiken Prize in English Language and Literature

Value: $350.
Conditions: Awarded to an outstanding student entering third year Honors English, providing a grade of 6 or better has been achieved in all English courses.
Donor: Endowed by the late Sir James Aiken.

The Frank Bessai Memorial Scholarship in Old English

Value: $550.
Conditions: To be awarded annually to an outstanding undergraduate student in the area of Old English, provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made. (Undergraduate students in any one or more of the following courses will be eligible: English 320 or 420.)
Donor: Endowed by friends of the late Frank Bessai, in recognition of his services in the Department of English, 1960-1969.

The James Patrick Folinsbee Prize in English

Value: up to $300.
Number: 1 or 2 (not exceeding $300 in total).
Conditions: To be awarded annually to an outstanding undergraduate student (or students) in the area of Creative Writing whose writing shows greatest merit, provided that the student's academic record is otherwise satisfactory in the year of the award. If there are no suitable candidates, no awards will be made. (Undergraduate students in any one or more of the following courses will be eligible: English 376, 377, 378, 379, 407, 408.)

The James Patrick Folinsbee Memorial Scholarship in Creative Writing

Value: Up to $2,200.
Number: 1 or 2 (not exceeding $2,200 in total).
Conditions: To be awarded to a student (or students) of demonstrated ability in creative writing who will be entering fourth year of the Honors English program or any year of a graduate program in English. Also open to students from elsewhere who are entering a graduate program in English at The University of Alberta.
Donor: Endowed by the late Dr. F. J. Folinsbee.
Apply: To Chairman of the Department by June 1.

The Denis Godfrey Memorial Book Prize

Field of Study: English Literature of the Romantic Period.
Value: $100.00 in books.
Conditions: Awarded annually to an outstanding undergraduate student working toward a bachelor's degree, provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made. (Undergraduate students taking for credit at least one of the following courses will be eligible: English 345, 356, and appropriate 400-level English courses.)
Donor: Endowed by members of the Department of English, the Faculty of Arts and the Alma Mater Fund of the University of Alberta Alumni Association in memory of the late Professor Emertus Denis Godfrey.

The R. K. Gordon Prize in Chaucer

Value: $100.
Conditions: To be awarded annually to an outstanding undergraduate student in English 316 (Chaucer), provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made.
Donor: The Friends of the University, in memory of the late Professor Emeritus Gordon.

The Priscilla Hammond Memorial Prize in English 200

Value: $200.
Number: 2.
Conditions: To be awarded annually to outstanding undergraduate students in English 200, provided that their academic record is otherwise satisfactory in the year of the award. If there are no suitable candidates, no awards will be made.
Donor: Endowed by Mrs. Edith Hammond, in memory of her daughter.

The Priscilla Hammond Memorial Scholarship in Honors English

Value: $750.
Number: 2.
Conditions: Awarded to the students entering final year Honors English who in the judgment of the department show the greatest ability and promise in the field of English scholarship or in creative work in English.
Donor: Endowed by Mrs. Edith Hammond, in memory of her daughter.

The Hurtig Publishers Book Prize in Canadian Literature

Value: $50 in books.
Conditions: To be awarded annually to an outstanding undergraduate student in the area of Canadian Literature, provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made. (Undergraduate students in any one or more of the following courses will be eligible: English 367, 369, 370, 371, 384, 474, 475.)
Donor: Hurtig Publishers, Edmonton.

The J. T. Jones Prize in Milton

Value: $200.
Conditions: To be awarded annually to an outstanding undergraduate student in English 340 (Milton), provided that the students' academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made.
Donor: Endowed by Friends of John Thomas Jones, in recognition of his service in the Department of English 1922-1964.

The Longman Book Prize in Restoration and Eighteenth Century Literature

Value: $50 in books.
Conditions: To be awarded annually to an outstanding undergraduate student in the area of Restoration and Eighteenth Century Literature, provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made. (Undergraduate students in any one or more of the following courses will be eligible: English 341, 343, 440.)
Donor: Longman Canada Limited.

The J. H. Shoctor Prize in Modern Drama

Value: $100.
Conditions: To be awarded annually to an outstanding undergraduate student in English 362 (Modern British and American Drama) or English 363 (Modern Drama), provided that the student's academic record is otherwise satisfactory in the year of the award. If there is no suitable candidate, no award will be made.
Donor: Mr. J. H. Shoctor, Q.C., Edmonton.

GEOGRAPHY

See under Faculty of Science awards.

GERMANIC LANGUAGES

The Friends of Berlin Study Travel Award

Value: $500.
Conditions: To be offered annually to an undergraduate student for study of the German Language in Germany. Applicants should already be at the advanced level. The award may be used either during a summer or during an academic year.
Where tenable: At an institution in Germany, approved by the Department of Germanic Languages.
Donor: The Friends of Berlin, Alberta Association.
Apply: To the Chairman of the Department of Germanic Languages by March 1, giving an academic history and plans and location of proposed study.

The German Government Book Prizes

Number: 2.
Conditions: Offered annually to students for outstanding merit in German Literature courses provided that these students obtain a grade of not less than 7 in these courses, are carrying a full year's work and have a record satisfactory to the Faculty Council. A prize may not be given to the same student more than once.

The Ambassador of Switzerland's Book Prize in German

Conditions: Offered annually to a student for outstanding merit in senior German Literature courses, provided such student's record is otherwise satisfactory.

HISTORY

The Gold Medal in Prairie History

Field of study: Prairie History
Number: 1.
Conditions: To be awarded annually to a graduating student for the best essay in any undergraduate Canadian History course dealing with any aspect of Prairie History. The Prairie region is understood to comprise the territory bounded by the three present prairie provinces. The papers are to be judged by a committee of the Canadianist members of the Department of History.
Donor: Mr. James H. Gray, Calgary.

The American Ambassador's Prize in American History

Value: Books.
Conditions: To be awarded to the top student in 300 level courses in American History and the top student in 400 level courses in American History.
Donor: The American Ambassador to Canada.

The Amisk Waskahegan Chapter Student Book Prize

Value: $50 in books.
Number: 1.
Conditions: Awarded to an undergraduate student on the basis of excellence of a term paper prepared for a 400 level Canadian History course, offered in the winter session on a theme related to Western Canada.
Donor: The Amisk Waskahegan Society Edmonton Chapter.

The James Barrington Prize in Southeast Asian History

Field of Study: History.
Value: $300.
Number: One.
Conditions: To be awarded annually to the student who attains the highest standing in Southeast Asian History.
Donor: Endowed by friends of James Barrington to commemorate his pioneering work in the establishment of the teaching of Southeast Asian History at the University of Alberta.

The Sir Winston Spencer Churchill Scholarship in Honors History

Value: $300.
Conditions: Offered to a student of outstanding merit completing third year in Honors History, conditional on the student's registration in fourth year Honors History and inclusion in the program of a course dealing with the history of the English speaking peoples.
Donor: The Sir Winston Churchill Society of Edmonton.

The Ross William Collins Memorial Book Prize

Value: $50 in books.
Conditions: Awarded to a student of outstanding merit in Renaissance and Reformation History provided the student achieves first class standing in the courses and the student's other work is satisfactory.
Donor: Mrs. M. H. Long.

The Trenholme Dickson and Letita S. Dickson Prize

Value: $150.
Conditions: Offered to a student of outstanding merit in the field of Canadian History, provided first class standing is attained and other subjects are passed.
Donor: Endowed by the late Letita S. Dickson.

The Barbara Fraser Memorial Prize

Field of Study: History.
Value: $100.
Number: One.

Conditions: To be awarded annually to the student enrolled in the Honors History program who has written an outstanding paper in any 400-level History course, provided that the student's academic record is otherwise satisfactory.
Donor: Endowed by friends of the late Barbara Fraser.

The History Club Prize

Value: $25.
Conditions: Offered to the student who obtains the second highest mark in the final examination in the history course of the first year, provided first class standing is achieved and all other courses are passed.

The Morden Heaton Long Prize in British History

Value: $50.
Conditions: Offered annually to a student of outstanding merit in British History provided that the student's record is otherwise satisfactory.
Donor: Friends of the late Professor Emeritus of History.

The Morden Heaton Long Memorial Prize in Honors History

Value: $100.
Conditions: Offered to the third year honors student with the best record, conditional upon the student's registration in the fourth year of Honors History.
Donor: Mrs. Winnifred Long, in memory of her late husband, a former head of the Department of History.

The Harold W. Riley Memorial Scholarship

Value: $750.
Conditions: Offered annually to a student of outstanding merit who has shown a special interest in the history of Western Canada, provided the student's record is otherwise satisfactory and provided the recipient is returning as an undergraduate student in the next academic year.
Donor: Endowed by the late Mrs. Riley.

George Malcolm Smith Memorial Book Prize

Value: $50 in books.
Conditions: Awarded to a student of outstanding merit in Modern European History, provided that the student attained first-class standing in the course, carried a full year's work and passed all his or her other subjects.
Donor: Mrs. M. H. Long.

The John Henry Stanley Memorial Prize

Value: $200.
Conditions: Awarded annually to a student of outstanding merit in Canadian History provided this student is taking a full year's work and passes all other subjects.
Donor: Endowed by Dr. George F. G. Stanley in memory of his father.

The Henry Gerrie Ward Essay Prize in Western Canadian History

Value: $300.
Number: 1.
Conditions: To be awarded annually to a student who has written the best essay in History 470 (The Canadian West to 1870) or History 471 (The Canadian West since 1870) on a topic in Western Canadian History. A panel, composed of members of the Department of History, will judge the essays. If the panel feels that no essay submitted is worthy, no award will be made.
Donor: Mrs. Jean Ward and family in memory of their late husband and father.

MATHEMATICS

See under Faculty of Science awards.

MUSIC

The Edmonton Opera Guild Scholarship

Field of study: Opera.
Value: $605.
Number: 1.
Conditions: To be awarded to a student completing first, second or third year of the Bachelor of Music program for outstanding merit in studies in Voice.
Donor: The Edmonton Opera Guild. Selection will be made by the Department of Music.

The Richard Eaton Scholarship in Music

Value: $1,000.
Conditions: To be awarded to a student in or entering into the Bachelor of Music program, for very outstanding musical merit. If given to a graduating student, such a recipient must be continuing his or her musical education at an institution or under a teacher approved by the Department. If no suitable candidate is available in any one year, the award will not be given.
Donor: Endowed by friends of the late Professor R. S. Eaton.

The Abigal Edith Condell Memorial Scholarship in Music

Value: $700.
Conditions: To be awarded annually to a student of outstanding merit at the end of the third year of the Bachelor of Music program.
Donor: Endowed by the Edmonton Musical Club using funds provided by the late Abigal Edith Condell.

The Margarita Heron, Pine Lake Cello Prize

Value: $150.
Number: 1.
Conditions: To be awarded annually to a serious cello student enrolled in the Undergraduate Program in the Department of Music. Selection will be based on general musicianship and cello competency.
Donor: Endowed by Mr. S. A. Heron and family.

The Peace River Pioneer Memorial Scholarships in Music

Number: 7.
Value: One at $1,000 and six at $500.
Conditions: Awarded annually to students of outstanding merit completing the first, second or third year of the Bachelor of Music program.
Donor: Endowed by the late Mr. Charles Plavin of North Star, Alberta.

The Eva Shaw Memorial Prize in Music

Value: $100.
Conditions: Awarded annually to a student of

outstanding merit in any year of the Bachelor of Music program.
Donor: The children of the late Mrs. Roy Shaw.

The Richard Eaton Singers Scholarship in Voice

Value: $500.
Conditions: To be awarded to a student completing first, second or third year of the Bachelor of Music program for outstanding merit in studies in voice. Selection will be made by the Department of Music.
Donor: The Richard Eaton Singers.

The Women's Committee of The Edmonton Symphony Society Scholarships

Value: $400.
Number: 3.
Conditions: Offered annually on the basis of musical merit, to three students, one entering second, third or fourth year of the Bachelor of Music program and majoring in orchestral instruments.

The Yamaha Music Scholarship

Field of study: Piano.
Value: $300.
Number: 1.
Conditions: Awarded annually to a student of outstanding pianistic ability and above-average academic standing, completing the first, second, or third year of the Bachelor of Music program in Applied Music.
Donor: Yamaha Pianos Coyne Ltd., Edmonton.

PHILOSOPHY

The MacEachran Gold Medal in Philosophy

Conditions: Offered to the student graduating with Honors in Philosophy or Philosophy and Greek with the highest standing in the last two years of the program, provided first class standing is attained.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.

The William Irvine Memorial Prize in Ethics

Value: $450.
Conditions: Offered to a student of outstanding merit in Philosophy 354, provided that the student's academic record is otherwise satisfactory.
Donor: Endowed by friends of the late Mr. Irvine.

The MacEachran Humanities Scholarships in Philosophy

Field of study: Philosophy.
Value: $500.
Number: 2.
Conditions: To be awarded to two students in the Department of Philosophy for outstanding academic merit at the end of the third year of the honors programs.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.

POLITICAL SCIENCE

The Duncan Alexander MacGibbon Gold Medal in Political Science

Conditions: Awarded to the student graduating from Honors Political Science with highest distinction.
Donor: Endowed by the late Dr. D. A. MacGibbon of Hamilton, Ontario.

The I.O.D.E. Westward Ho! Chapter Memorial Prize in Political Science

Value: $150.
Conditions: To be awarded annually to a student for outstanding merit in Political Science 361/362, International Relations, provided that the student's record is otherwise satisfactory to the Faculty Council.
Donor: Endowed by the Westward Ho! Chapter I.O.D.E. of Edmonton upon its dissolution and in memory of its deceased members.

PSYCHOLOGY

The MacEachran Gold Medal in Psychology

Conditions: Awarded to the student graduating from Honors Psychology with the highest standing on the final two years of the program, provided first class standing is attained.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.

The A. W. Fraser and Associates Scholarship

Value: Tuition and fees.
Number: 1.
Conditions: To be awarded annually to a student entering second, third or fourth year in the honors program of the Department of Psychology (Arts or Science) on the basis of academic standing and financial need.
Donor: A. W. Fraser and Associates of Edmonton.

The MacEachran Humanities Scholarships in Psychology

Field of study: Psychology.
Value: $500 each.
Number: 2.
Conditions: To be awarded to two students in the Department of Psychology for outstanding academic merit at the end of the third year of the honors programs.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.

RELIGIOUS STUDIES

The Esther Fraser Memorial Scholarship

Value: $225.
Number: 1.
Conditions: Awarded annually for academic excellence to a student majoring in Religious Studies in a second, third or fourth year program at The University of Alberta.
Donor: The family of Esther Fraser as a memorial.

ROMANCE LANGUAGES

The Manoel Faucher Book Prize in French

Field of Study: Romance Languages.
Number: One.
Conditions: To be awarded annually to the graduating student with the highest average over the last two years in French Literature courses.
Donor: Friends of Manoel Faucher, Professor Emeritus of Romance Languages.

The French Government Book Prizes

Number: 2.
Conditions: Awarded each year to two students in French 581 who write the best essays on a contemporary author.
Donor: The Consul of France in Alberta.

The Belgian Government Book Prize

Conditions: Offered to the student who obtains the highest standing in French 360 and 461 provided that the student's record is satisfactory.

The French Government Book Prizes

Number: 2.
Conditions: Awarded to the students with the highest standings in French 200 and 201, provided such students' records are satisfactory to the Faculty Council.

The Minister of Spain's Book Prize in Spanish

Conditions: To be awarded annually to an outstanding student in Spanish Language or Literature, provided the student's record is otherwise satisfactory to the Faculty Council.
Donor: The Minister of Spain to Canada.

The Ambassador of Switzerland's Book Prize in French

Conditions: Offered annually to the student with the highest standing in French 574 or 576, provided that the student's record is otherwise satisfactory to the Faculty Council.

The Ambassador of Switzerland's Book Prize in Italian

Conditions: Offered annually to the student with the highest standing in Italian 360, provided that the student's record is otherwise satisfactory to the Faculty Council.

SLAVIC LANGUAGES

The Royal Canadian Legion, Norwood Branch, Prizes in Ukrainian

Value: $100 each.
Number: 4.
Conditions: Awarded annually to students of outstanding merit in Ukrainian 200 or 304. Awards to be based on marks in these courses only.

The Ukrainian Canadian Committee Prize

Value: $100.
Conditions: Offered to a student of outstanding merit in Ukrainian Literature 481 or 482, provided the student's record is otherwise satisfactory.

The Ukrainian Catholic Women's League Prize

Value: $100.
Conditions: Awarded to the student with the highest standing in Ukrainian 100, provided that the student's record is otherwise satisfactory.

The Ukrainian National Association Prize

Value: $100.
Conditions: Offered to a student of outstanding merit in Ukrainian Literature 412, 481 or 482, provided that the student's record is otherwise satisfactory.

The Ukrainian Professional and Business Men's Club Prizes

Field of study: Ukrainian Language in Education.
Value: $150.
Number: 2.
Conditions: Offered annually on the basis of academic achievement and prospects of good teaching ability to two students from the Faculty of Education who are registered in a Ukrainian language course, in the Department of Slavic Languages. One prize to a student entering third year and one prize to a student entering fourth year.
Donor: The Ukrainian Professional and Business Men's Club.

The Ukrainian Women's Association of Canada (Alberta Branch) Prize

Value: $100.
Conditions: Offered to a student of outstanding merit in Ukrainian 304, 311 or 362, provided that the student's record is otherwise satisfactory.

SOCIOLOGY

The Samuel M. Strong Gold Medal or Prize in Sociology

Conditions: Awarded to the student graduating from Honors Sociology with the highest standing on the final two years. The medal will be awarded only if the student attains first class standing, otherwise a book prize of $25 will be provided.
Donor: Endowed by friends of the late Dr. Strong.

The Soren Bovbjerg Memorial Scholarship

Value: $700.
Number: 1.
Conditions: To be awarded annually on the basis of academic standing and financial need to an undergraduate student enrolled in a four year degree program in the Department of Sociology.
Donor: Endowed anonymously.
Apply: Administrator of Student Awards by June 1.

The Tammy Usiskin Memorial Prize

Field of study: Gerontology.
Value: $50.
Conditions: Offered annually to a student on the basis of outstanding undergraduate course work in the field of Gerontology.
Donor: Endowed by the Edmonton Section, Council of Jewish Women.

223.4 *Faculty of Business Administration and Commerce*

223.4.1 MATRICULATION AWARDS

The William Norman Grace Memorial Bursary

Value: $2,200.
Conditions: To be awarded annually on the basis of academic standing and financial need, to a student who has been an Alberta resident for at least 12 months prior to application, and who is entering first year at The University of Alberta. Preference will be given to students entering the Faculty of Business Administration and Commerce.
Donor: Endowed anonymously.
Apply: Administrator of Student Awards by July 15.

The Melcor Developments Limited Scholarship

Value: $350.
Conditions: Awarded on the basis of high scholastic standing from an Alberta high school and financial need.
Apply: Administrator of Student Awards by July 15.

223.4.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The T. Eaton Company Limited Gold Medal in Commerce

Conditions: Awarded to the graduating student who obtains the highest standing in the course of the final two years.

The Financial Executives Institute Silver Medal in Finance

Conditions: Awarded to the graduating student who has completed Finance 304, 411, and 432 with the highest grade point average, provided that the student's academic record is otherwise satisfactory. If there is no suitable candidate, no award will be made.
Donor: The Financial Executives Institute, Edmonton Chapter.

The Alberta Construction Labour Relations Association Chairman's Scholarship

Field of study: Industrial Relations.
Value: $500.
Number: 1.
Conditions: Offered each odd-numbered year to an outstanding student entering the third or fourth year of a program in industrial relations. Selection will be made on the basis of academic attainment, interest in construction labour relations and financial need of the student. There will be some preference to those who have been affiliated in some way with the construction industry.
Donor: The Alberta Construction Labour Relations Association in honour of its chairman, Mr. Jock Dawe.

The George C. Berge Scholarship

Field of Study: Accounting.
Value: $300.
Number: One.
Conditions: Offered annually to a student of outstanding merit entering the third year of a Bachelor of Commerce Program majoring in Accounting.
Donor: Mrs. Kathleen E. Berge of Edmonton.

The Board of Governors Prizes in Business Administration and Commerce

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for the first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Cooke Shandling Prize in Business Law

Value: $100.
Number: 1.
Conditions: Awarded annually to a student of outstanding merit in Legal Relations 310.
Donor: Cooke Shandling, Barristers and Solicitors, Edmonton.

The Gardner, McDonald & Co. Scholarship

Field of Study: Accounting.
Value: $600.
Number: One.
Conditions: To be awarded annually to a student of outstanding merit entering the final year of the program leading to the degree of Bachelor of Commerce majoring in Accounting. This Scholarship is to be awarded to a student intending to pursue a career in Chartered Accountancy.
Donor: Gardner, McDonald & Co.

The General Motors Scholarship

Field of study: Engineering or Business Administration.
Value: $1,000.
Number: 2.
Conditions: Applicants must have a minimum grade point average of 7.5. Students must also be entering their penultimate or last year of study. Applicants must have career objectives applicable to the automotive industry. Recipients must serve an internship with GM during the summer after the year in which the award is payable.
Donor: General Motors of Canada Limited.
Apply: Administrator of Student Awards.

The Hudson's Bay Company Tuition Awards in Commerce

Value: Tuition and fees for fourth year.
Number: 2.
Conditions: Offered to students having an interest in a merchandising career on the basis of academic standing and potential executive ability. Winners of the awards will be offered full-time employment during the summer preceding the fourth year.
Donor: Hudson's Bay Company, Edmonton, Alberta.
Apply: Dean of Business Administration and Commerce by February 15.

The Kaiser Oil Ltd. Scholarships

Field of study: Science, Engineering and Business Administration.
Value: $500.
Number: 2.
Conditions: To be awarded annually to students entering the third year of Science, Engineering or Business Administration on the basis of academic standing and financial need.

Donor: Kaiser Oil Ltd., Calgary, Alberta.
Apply: Administrator of Student Awards by June 1.

The 3M Bursary in Business Administration

Field of Study: Business Administration.
Value: $500.
Number: One.
Conditions: To be awarded annually on the basis of academic standing and financial need to a student completing first, second or third year in the Faculty of Business Administration and Commerce.
Donor: 3M Canada Inc., London, Ontario.
Apply: Administrator of Student Awards by June 1.

The Lennie M. McNeill Memorial Prize

Value: $100.
Conditions: Awarded to a woman student of outstanding merit completing first, second or third year in the Faculty of Business Administration and Commerce, based on her performance in the year just completed.
Donor: The Soroptimist Club of Edmonton.

The Marsh and McLennan Limited Centennial Scholarship

Value: $500.
Conditions: Offered on the basis of academic standing and financial need to a student entering second year in the Faculty of Business Administration and Commerce.
Donor: Marsh and McLennan Limited, of Calgary, as a mark of Canada's Centennial year.
Apply: Administrator of Student Awards by June 1.

The Petro-Canada Scholarship in Business Administration and Commerce

Value: $500.
Number: 1.
Conditions: Awarded annually on the basis of academic attainment to a student entering second, third or fourth year of Business Administration and Commerce. Candidate must be a Canadian citizen who has resided in any of the four Western Provinces for the preceding two years. There is also a possibility of summer employment with Petro- Canada.
Donor: Petro-Canada, Calgary, Alberta.

The Renkenberger Scholarship

Field of study: Agriculture and Forestry, Arts, Science, Education or Business Administration and Commerce.
Value: $250.
Conditions: Open to undergraduates in any of the above faculties who are interested in co-operative marketing. The basis of the award will be academic standing and participation in relevant extracurricular activities.
Apply: Administrator of Student Awards by June 1.

The Thorne, Riddell and Co. Scholarship

Field of study: Accounting.
Value: $300.
Conditions: Offered annually to a student of outstanding merit entering fourth year of the Bachelor of Commerce program majoring in Accounting.

The Touche Ross and Co. Scholarship

Field of study: Accounting.
Value: $300.
Conditions: Awarded to a student entering the final year of the program leading to the degree of Bachelor of Commerce, majoring in Accounting and who has indicated an intention to proceed into chartered accountancy after graduation. Selection will be made on the basis of academic record and personal suitability for the profession.

The Winspear Higgins Stevenson and Co. Scholarship

Field of study: Accounting.
Value: $250.
Conditions: Offered to a student entering fourth year of the degree program for Bachelor of Commerce majoring in Accounting.

223.5.1 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically. Awards in the Dental Hygiene Program are listed under 223.5.3.

The Alberta Dental Association Gold Medal

Conditions: Awarded to a graduating student for outstanding merit in the work of the fourth year, provided that an average of at least 7.0 is attained.

The Arthur D. Cumming Gold Medal

Field of study: Dentistry for children.
Conditions: Awarded to a graduating student for outstanding merit in dentistry for children, provided that at least 7.0 average is attained on the final year.
Donor: Endowed by the late Mr. Cumming of Calgary.

The James McCutcheon Honor Award

Value: Gold medal and a cash prize of $400.
Conditions: Offered to a student completing the final year of the D.D.S. program who, over the four years of the program, has shown to possess to an outstanding degree those qualities of scholarship, leadership, and character which may be expected to lead to a distinguished position in the dental profession. The recipient will be selected by a committee on which faculty, students, and alumni will be represented. The award may be made to more than one student, in any one year, and may be withheld in the event that no sufficiently deserving candidate is available.
Donor: Dental Alumni Association of The University of Alberta.

The American Academy of Oral Medicine Award

Value: A five-year subscription to the "Journal of Dental Medicine".
Conditions: Awarded to the graduating student who has displayed the greatest interest in dental medicine.

The American Academy of Oral Pathology Award

Value: A one-year subscription to the "Oral Surgery, Oral Medicine, and Oral Pathology."
Conditions: Awarded to a graduating student who has shown interest, effort and ability in the field of oral pathology.
Note: The award will be made through the Office of the Dean on the recommendation of the Faculty Academic Standing Committee.
Donor: The American Academy of Oral Pathology.

The American Academy of Periodontology Award

Value: A one-year subscription to the "Journal of Periodontology".
Conditions: Awarded to a graduating student who has excelled in the field of Periodontics.
Note: The award will be made through the Office of the Dean on the recommendation of the Faculty Academic Standing Committee.
Donor: The American Academy of Periodontology.

The American Association of Endodontists Award

Value: A one-year membership in the American Association of Endodontists and a one-year subscription to the "Journal of Endodontics".
Conditions: Awarded to a graduating student who has shown a particular interest and competence in the field of Endodontics.
Note: The award will be made through the Office of the Dean on the recommendation of the Faculty Academic Standing Committee.
Donor: The American Association of Endodontists.

The American Academy of Dental Radiology Award

Value: Membership in the American Academy of Dental Radiology with waiver of initiation fee and the first year dues. A subscription to the "Triple 0 Journal" at the Academy's group rate.
Conditions: Awarded to a senior student who has shown exceptional interest and accomplishment in Dental Radiology.
Note: The award will be made through the Office of the Dean on the recommendation of the Faculty Academic Standing Committee.
Donor: The American Academy of Dental Radiology.

The American Society of Dentistry for Children Award

Value: A one-year subscription to "American Journal of Dentistry for Children."
Conditions: Awarded to a student of outstanding merit in dentistry for children, in the fourth year.

The Canadian Academy of Periodontology Book Prize

Value: Books to the value of $50.
Conditions: To be awarded annually to the graduating student from the Faculty of Dentistry with the highest marks in Periodontia.
Donor: The Canadian Academy of Periodontology.

The Canadian Society of Oral Surgeons Prize

Value: A book on Oral Surgery supplied by the donor.
Conditions: To be awarded to the graduating student who has achieved the highest standing in the courses in Oral Surgery.
Donor: The Canadian Society of Oral Surgeons.

The Alberta Dental Association Pre-Professional Scholarship

Value: $300.
Conditions: Offered to a student entering first year Dentistry who has shown outstanding merit in the pre-professional work at a university in Alberta, provided that the student has attained an average of 7.0 or better over the two years.

The Alberta Dental Association Bursaries

Value: One of $350 and one of $300.
Number: 2.
Conditions: Offered to students at the end of first, second or third year, on the basis of academic standing and financial need.
Apply: Administrator of Student Awards by June 1.

The Aurum Ceramic Laboratories Scholarship

Value: $400.
Number: 1.
Conditions: Offered to a student entering fourth year who has shown outstanding merit in the field of fixed partial denture prosthodontics.
Donor: Ceramic Dental Laboratories Limited of Edmonton.

The Board of Governors Prizes in Dentistry

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Harry Ernest Bulyea Prize

Field of study: Operative and Restorative Dentistry.
Value: $250.
Conditions: Offered to the third-year student with the highest average mark in all courses in Operative and Restorative Dentistry.
Donor: The University of Alberta Dental Alumni Association in memory of the first Director of the School of Dentistry.

The Calgary and District Dental Society Prize

Value: $200.
Conditions: Offered annually to a student entering third year who shows outstanding merit in the basic science courses of the first two years of Dentistry, provided that he or she achieves an average of 7.0 or better in these courses.

The Calgary and District Gnathological Society Prize

Value: $100.
Number: 1.
Conditions: To be awarded annually to a student completing the third year of Dentistry, on the basis of excellence in the field of fixed prosthetics.
Donor: The Calgary and District Gnathological Society.

The Canadian Fund for Dental Education Scholarships

Value: $250.
Number: 2.
Conditions: To be awarded annually to the students with the highest mark in each of the second and third year showing a special interest in preventive dentistry.
Donor: The Canadian Fund for Dental Education sponsored by Cooper Laboratories.

The Arthur D. Cumming Bursaries

Value: As below.
Number: 4.
Conditions: Awarded as follows: (1) two bursaries at $500 each to students entering first year Dentistry based on pre-professional work at a university in Alberta; (2) two bursaries of $1,000 offered, on the basis of academic standing and financial need, to students entering second or third or fourth years of the Faculty.
Donor: Endowed by the late Mr. Cumming of Calgary.
Apply: For item (2) apply to Administrator of Student Awards by June 1.

The Dental Alumni Association Prizes

Value: $150.
Number: 3.
Conditions: Prizes are awarded annually to students completing first, second and third year in the Faculty of Dentistry who demonstrate all-round leadership in student activities, character development, as well as academic achievement.
Donor: The University of Alberta Dental Alumni Association.
Apply: The Dean of the Faculty of Dentistry by April.

The Dental Class of '41 Prize

Field of study: Oral Diagnosis.
Value: $50.
Conditions: Offered to a student entering fourth year on proficiency in Oral Diagnosis.
Donor: Endowed by the Dental Class of 1941.

The Dental Class of 1950 Bursary

Value: Approximately $200.
Conditions: Offered on the basis of academic standing and financial need to a student who has completed the second year and is entering the third year in the Faculty of Dentistry.
Donor: Endowed by the Dental Class of 1950 through Canada Permanent Trust.
Apply: Administrator of Student Awards by June 1.

The Edmonton and District Dental Society Prizes

Value: $100 each.
Number: 3.
Conditions: Prizes are awarded for (1) outstanding merit in the first year; (2) outstanding merit in the third year; (3) outstanding merit in Periodontics in the graduating year, provided that, in all cases, an average of at least 7.0 is achieved. General character and interest in student activities may be taken into consideration.

The M. H. Garvin Scholarship Fund in Dentistry

Value: Variable.
Number: Variable.
Conditions: Open to undergraduates in the Faculty of Dentistry or graduates of the most recent year, to encourage study or research. Awards will be based on academic standing, professional and personal qualifications and financial need.
Donor: The Western Canada Dental Society has established a fund at The University of Alberta.
Apply: Dean of the Faculty of Dentistry.

The Harry Alexander Gilchrist Prize

Field of study: Prosthetic Dentistry.
Value: $250.
Conditions: Offered to the third year student with the highest average mark in all courses in Prosthetic Dentistry.
Donor: The University of Alberta Dental Alumni Association, in memory of the former Professor of Dentistry.

The W. Scott Hamilton Book Award in Oral Surgery

Field of study: Oral Surgery.
Value: About $80.
Number: 1.
Conditions: To be awarded annually on the basis of outstanding academic attainment to a third year student in the field of oral surgery.
Donor: Members of the Alberta Dental Profession.

The International College of Dentists (Canadian Section) Prize

Value: $200.
Conditions: Offered annually to a student completing the third year of Dentistry, on the basis of outstanding merit in that year, general character, and participation in extracurricular activities.

The Dr. R. R. McIntyre Memorial Scholarship

Field of study: Interceptive and Preventive Orthodontics.
Value: $200.
Conditions: Awarded to a student completing third year Dentistry for outstanding merit in Interceptive and Preventive Orthodontics, provided that an average of at least 7.0 has been attained on the whole year's work.
Donor: Calgary and District Dental Society.

The C. V. Mosby Book Awards

Value: $50 in books each.
Number: 3.
Conditions: Awarded annually to students of outstanding merit in the Faculty of Dentistry.
Donor: C. V. Mosby Company Ltd.

The Dr. Melville Kahn Prize in Restorative Dentistry

Value: $100.
Conditions: Awarded annually for outstanding merit in Restorative Dentistry in the third year.
Donor: The family of the late Dr. M. Kahn, Vancouver.

The Shaw Laboratories Scholarship

Value: $400.
Conditions: Open to students entering second, third or fourth year Dentistry on the basis of academic standing and financial need.
Donor: The Shaw Laboratories Limited.
Apply: Administrator of Student Awards by June 1.

The Dr. James Zimmerman Scholarship

Value: $200.
Number: 1.
Conditions: To be awarded annually to a student completing the second or third year of the program. The award is based on academic attainment and financial need.
Donor: The Calgary and District Dental Society.
Apply: Administrator of Student Awards by June 1.

223.5.2 GRADUATE AWARDS IN DENTISTRY

NOTE: For other general graduate awards refer to § 224 of the Awards Calendar or the Graduate Studies and Research Calendar.

The Medical Research Council of Canada Awards

Studentships of $6,750 are available from the Council for highly qualified holders of a B.Sc. to do Master's or Ph.D. work in a basic science in a department of a Faculty of Medicine, Pharmacy or Dentistry.

Holders of a professional degree, or of a Ph.D. degree in a basic science, may apply under the Council's fellowship program for further training or research.

Further information may be had from the Dean's Office. All applications are to be forwarded to the Secretary, Medical Research Council, Montreal Road, Ottawa K1A 0R6.

223.5.3 DENTAL HYGIENE PROGRAM

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Dental Hygiene Gold Medal and Prize

Value: Gold Medal plus $50.
Conditions: Awarded to the student graduating with the highest standing from the Dental Hygiene Program.
Donor: Alberta Dental Association.

The Alberta Dental Hygienists' Association Silver Award

Value: An engraved silver tray.
Conditions: Awarded to the student graduating with the second highest standing from the Dental Hygiene Program.

The Alberta Dental Association Prize in Dental Hygiene

Value: $100.
Conditions: Offered annually to a student of outstanding merit entering second year in the Dental Hygiene Program.

The Board of Governors Prize in Dental Hygiene

Value: $100.
Conditions: To be awarded to the student with the highest academic average at the end of the first year of the Program. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Dr. M. J. Lipkind Prize for General Proficiency

Value: $75.
Conditions: Offered annually to a student entering second year for general proficiency in the first year.
Donor: Dr. M. J. Lipkind, Calgary.

The Margaret Berry MacLean Prize

Value: $50.
Conditions: To be awarded to a student of outstanding merit at the end of the first year in the Dental Hygiene Program.
Donor: Endowed by Mrs. Margaret Berry MacLean, a former director.

The C. V. Mosby Book Award

Value: $30 in books.
Conditions: Awarded to a student for outstanding merit in the first year.
Donor: C. V. Mosby Company Ltd.

223.6.1 MATRICULATION AWARDS

The Amelia Viola Lobb Memorial Bursary

Value: $400.
Conditions: To be offered annually to a student from an Alberta high school who will be entering first year of the Faculty of Education. The award will be based on academic standing and financial need.
Donor: Endowed through the will of the late Miss Lobb who taught for an extensive period of time in the Province of Alberta.
Apply: Administrator of Student Awards by July 15.

The MacEachran Memorial Bursary in Education

Value: $750.
Number: 2.
Conditions: To be offered on the basis of academic standing and financial need to a student from an Alberta high school entering first year of the Faculty of Education.
Donor: Endowed by the late Professor Emeritus J. M. MacEachran.
Apply: Administrator of Student Awards by July 15.

223.6.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Milton Ezra LaZerte Gold Medal

Conditions: The medal is awarded to the student who has shown the highest general proficiency in the final two years of the Bachelor of Education program.
Donor: Alberta Teachers' Association in honor of the former Dean of the Faculty.

The Pearl Turner Memorial Prize

Field of study: Early Childhood Education.
Value: $100.
Number: 1.
Conditions: Awarded annually to a graduating student who has specialized in early childhood education. In selecting a recipient, the Committee will look at personal and professional qualities combined with academic achievement.
Donor: The Edmonton Branch of the Canadian Committee on Early Childhood (O.M.E.P.).

The Alpha Chapter Delta Kappa Gamma Society International Memorial Award

Value: $200.
Conditions: To be awarded to a woman student of outstanding academic merit completing third year of the Bachelor of Education program and proceeding into fourth year in the immediate next session.
Donor: The Delta Kappa Gamma Society, Edmonton.

The Board of Governors Prizes in Education

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Margaret Ann Brine Scholarship in Music Education

Value: $600.
Conditions: To be awarded annually to a student of outstanding merit at the end of the first, second or third year of the Bachelor of Education program, majoring in Music.
Donor: Endowed by the Edmonton Musical Club upon its dissolution in 1973.

The Earl Buxton Memorial Scholarship

Field of study: Secondary Education.
Value: $200.
Number: 1.
Conditions: To be awarded annually on the basis of academic standing to a student completing the second or third year of the secondary route of the B.Ed. Program, who is majoring in the teaching of English.
Donor: Family and friends of the late Earl Buxton.

The Leslie Ann Dick Memorial Scholarship

Field of Study: Early Childhood Education.
Value: $500.
Number: One.
Conditions: To be awarded annually to a student entering the third year of the Faculty of Education with specialization in Early Childhood Education. Selection will be based on high academic achievement combined with a genuine commitment to children displayed through class projects and related summer work experience.
Donor: Mr. Allan M. Jack of Edmonton.

The Edmonton Jewish Community Council Prize

Field of study: Home Economics in Education.
Value: $100.
Conditions: Offered annually to a student of outstanding merit in the second year B.Ed. program with options in Home Economics. If no suitable candidate is found in this program, the award may be made in any second year program.

The Friends of the University Scholarship in Early Childhood Education

Field of Study: Elementary Education (Early Childhood).
Value: $250.
Number: One.
Conditions: To be awarded annually on the basis of high academic attainment to a student entering the fourth year of the B.Ed. program, specializing in Early Childhood Education.
Where Tenable: University of Alberta.
Donor: Friends of the University.

The M. E. LaZerte Memorial Scholarship

Value: $500.
Conditions: Offered annually to a student completing first year of the Bachelor of Education program and proceeding into second year in the succeeding academic session. The basis of the award will be academic standing and promise of professional competence.
Donor: Education Society of Edmonton.

The Florence Hallock Memorial Scholarship

Field of study: Home Economics in Education.
Value: $500.
Conditions: Offered annually to a student of outstanding merit completing the third year and entering the fourth year of the Faculty of Education with a major in Home Economics.
Donor: Edmonton Home Economics Association.

The Dr. May Hall James Exchange Scholarship

Value: $1,100.
Conditions: The Faculty of Education of The University of Alberta has an arrangement with Central Connecticut State College under which an annual exchange of a student from each institution to the other takes place. Applicants must be single females who have just completed the first year of the B.Ed. degree program. The basis of award will be high academic standing, suitable personal qualifications, and an interest in extracurricular activities.

Full academic credit will be given for the year's study in Connecticut. A student accepted on this exchange will be considered eligible for other awards or financial assistance for the year away.
Donor: The Escheated Estates Fund of The University of Alberta.
Apply: The Dean of the Faculty of Education by May 1.

The W. Dewar McDougall Memorial Bursary in Elementary Education

Value: $500.
Conditions: To be awarded annually on the basis of academic standing and financial need to a student completing the second or third year of the Elementary Route of the B.Ed. program and proceeding into the next year in the immediate next session.
Donor: Endowed in 1969 for 10 years by Mrs. Agnes McDougall in memory of her late husband, a member of the Faculty of Education 1945-61.
Apply: Administrator of Student Awards by June 1.

The Gordon Nicolson Memorial Scholarship in Vocational Education

Field of Study: Vocational Education.
Value: About $400.
Number: One.
Conditions: To be awarded annually to a full-time student entering the third year of the Vocational Education program on the basis of high academic standing and contribution to student life through departmental and faculty activities.
Donor: Endowed through a gift to the university by Mrs. Hertha Nicolson, widow of the late Mr. Gordon Nicolson.

The Honorable Ralph Steinhauer and Mrs. Steinhauer Scholarship

Field of Study: Project Morning Star at Blue Quills.
Value: $100.
Number: 1.
Conditions: To be awarded annually to the Morning Star student who obtains the highest grade point average on a minimum of 24 credits each year.
Donor: The Family (brothers and sisters) of the Honorable Ralph Steinhauer and Mrs. Steinhauer.

The Renkenberger Scholarship

Field of study: Agriculture and Forestry, Arts, Science, Education or Business Administration and Commerce.
Value: $250.
Conditions: Awarded to an undergraduate student who is especially interested in co-operative marketing. Basis of the award will be academic standing and participation in relevant extracurricular activities.
Donor: Bequest of the late Harvey Renkenberger of Barons, Alberta.
Apply: Administrator of Student Awards by June 1.

The Robert Henry Routledge Memorial Scholarship

Value: $100 each.
Number: 2.
Conditions: To be awarded annually to one female student and to one male student holding a Bachelor of Physical Education degree from The University of Alberta who have attained the highest averages in their programs while qualifying for a Bachelor of Education after a degree (Secondary Route) with specialization in Physical Education. At least one of the degrees must reflect competence in the administration of intramural sports programs in school systems.
Donor: Mrs. Saralie Routledge, of Edmonton, in memory of her late husband.

The University Bursary in Education

Value: $300.
Conditions: Offered on the basis of academic standing and financial need to a student completing the second or third year of the elementary route of the Bachelor of Education and proceeding into the next year in the immediate next session.
Donor: The Escheated Estates Fund of The University of Alberta.
Apply: Administrator of Student Awards by June 1.

The John and Vera Weir Scholarship in Special Education

Field of study: Special Education.
Value: $500.
Number: 4.
Conditions: Awarded annually to students entering third or fourth year of the Special Education Program. The basis for selection is satisfactory academic standing combined with such personal qualities as patience, dedication and understanding for those who have language and learning disabilities. The award is restricted to Canadian citizens who are permanent residents of Alberta. Financial need of the recipient may also be considered.
Donor: Mr. and Mrs. John Weir of Edmonton.

223.7.1 MATRICULATION AWARDS

APEGGA High School Tuition Bursaries

Field of Study: Engineering, Geology or Geophysics.
Value: Tuition and Fees.
Number: Twelve.
Conditions: Candidates are recommended by their High School teachers. Selection of winners is based on high academic standing, extra-curricular activities, and the personal qualities of the individual, the award is tenable at an Alberta university.
Donor: The Association of Professional engineers, Geologists and Geophysicists of Alberta.

The Hudson's Bay Oil and Gas Company Limited Bursary in Engineering

Value: $1,000 per year for four years.
Conditions: Awarded on the basis of scholastic achievement, personal qualities and character with due consideration to financial need. The applicant must state an intent to study engineering related to the petroleum industry. A new award will be made on the completion of the preceding one.
Apply: Administrator of Student Awards by July 15.

The Suncor Scholarship

Value: $500.
Conditions: Offered annually to a student entering first year of the Faculty of Engineering at The University of Alberta. The award will be based on academic standing and financial need.
Donor: Suncor Inc., Calgary.
Apply: Administrator of Student Awards by July 15.

Trans Mountain Oil Pipe Line Company Scholarships

Field of Study: Engineering or the Physical Sciences.
Value: $300 each plus a grant-in-aid to the University.
Number: 4.
Conditions: Offered to students whose homes are along the route of the Trans Mountain Pipe Line in Alberta from Edmonton west to the provincial boundary. Preference will be given to students from outside the city of Edmonton. Financial need may be taken into consideration.
Apply: Administrator of Student Awards by July 15.

223.7.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Henry Birks and Sons, Limited, Gold Medal

Conditions: Awarded to a graduating student from the Faculty of Engineering on the basis of academic standing in the final two years (grade-point average not less than 7.0) and qualities of leadership and character.

The APEGGA Gold Medals

Number: 6.
Conditions: Awarded to a graduating student from each of the fields of Chemical, Civil, Electrical, Mechanical, Mineral and Metallurgical Engineering. The basis will be the academic record of the third and fourth years combined, which must be a grade-point average not less than 7.0. The right is reserved to withhold the awarding of any or all medals.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The Jessie E. Paull Memorial Prize

Field of study: Highway Engineering.
Value: $200.
Conditions: Offered annually to the student obtaining the highest standing in Civil Engineering 510 provided that the student obtains a grade of at least 7 in this subject and is registered in a full year's program.
Donor: Endowed by Mr. A. M. Paull, formerly Chief Highway Construction Engineer, Province of Alberta.

The Society of Chemical Industry Merit Awards

Field of study: Biochemistry, Chemistry and Chemical Engineering.
Value: A gold key, and a year's subscription to "Chemistry and Industry".
Number: 3.
Conditions: Awards will be made to the student graduating with the highest standing in each of Honors Biochemistry, Chemistry and Chemical Engineering provided an average of at least 7.0 is attained in the final year, and that the program has been completed in the normal number of years.

The Allied Chemical Canada, Ltd. Scholarship in the Chemical Sciences

Field of study: Chemical Engineering or Honors Chemistry.
Value: $750.
Conditions: To be awarded annually to a student of outstanding academic merit entering the final year of either Chemical Engineering or Honors Chemistry. Personal qualities and participation in extra-curricular activities are also to be considered.
Donor: Allied Chemical Canada, Ltd.

The American Society for Testing and Materials Prize Awards

Field of study: Materials.
Value: A certificate, one-year subscription to "A.S.T.M. Bulletin" and a conversion slide rule.
Number: 2.
Conditions: Offered annually on the basis of demonstrated ability and interest in the field of materials, selection being made on the basis of performance in courses in materials: MNL E 458 and CIV E 401; or on the basis of a summer report on a topic related to materials.

The R. Angus Alberta Limited Scholarship

Field of study: Civil Engineering (Highway options).
Value: $500.
Conditions: Awarded to a student of outstanding merit entering fourth year Civil Engineering and registered in the elective courses in Highway Engineering. To qualify, the student must have achieved an average of at least 7.0 on the complete third year program in the Department.

The APEGGA H. R. Webb Memorial Scholarship

Value: Tuition and fees.
Conditions. Offered annually to a student completing the first and entering the second year of the Faculty of Engineering.

Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta, in memory of Professor H. R. Webb, former Registrar of the Association.

The Board of Governors Prizes in Engineering

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Cactus Drilling Corp. Ltd. Bursary

Field of study: Geology or Engineering.
Value: $500.
Conditions: Offered to a student entering final year of the general or honors program in Geology or final year in Engineering on the basis of academic standing, financial need and contribution to extracurricular student activities.
Apply: Administrator of Student Awards by June 1.

The Calgary Power Memorial Scholarships

Value: $500.
Number: 5.
Conditions: Awarded annually to students of outstanding merit entering second year of the Engineering program. One award in each of Chemical, Civil, Electrical, Mechanical and Mineral Engineering. The basis for the award is academic attainment during the first year.
Donor: Calgary Power Ltd., in memory of G. A. Gaherty, late Chairman of the Board of Calgary Power Ltd., and devoted friend of the University.

The Canada-Cities Service Ltd. Bursary

Field of study: Engineering or Honors Geology.
Value: $500.
Conditions: Offered annually to a student entering the fourth year of one of the above programs who has indicated an interest in the petroleum field. The basis of award will be academic standing and financial need.
Apply: Administrator of Student Awards by June 1.

The Bechtel Canada Limited Bursaries

Value: $600 each.
Number: 2.
Conditions: To be awarded to two students entering second year Faculty of Engineering based on the academic standing achieved in first year and financial need.
Apply: Administrator of Student Awards by June 1.

The Canadian Natural Gas Processing Association Book Prize

Value: A certificate and a $100 book prize.
Conditions: Awarded to a student completing third year and entering fourth year in the Faculty of Engineering.

The Canadian Natural Gas Processing Scholarship

Field of study: Chemical or Mechanical Engineering
Value: $400.
Number: 1.
Conditions: Awarded annually to a student entering the third year of a Chemical or Mechanical Engineering program at the University of Alberta. The basis for the award is academic standing and financial need.
Donor: Canadian Natural Gas Processing Association.

The Canadian Society for Chemical Engineering Prize in Chemical Engineering

Value: $25 and a silver medal.
Conditions: Awarded annually to the student in Chemical Engineering who obtains the highest standing in the work of the third year, provided that the student's general record is satisfactory to the Faculty of Engineering Council.

The Canadian Society for Civil Engineering Award

Field of study: Civil Engineering.
Value: $100 and commemorative plaque.
Conditions: Awarded annually to the student submitting the best chemical report for Civil Engineering 500. Selection will be made by a panel of practicing engineers nominated by the Executive Committee of the Edmonton Section, The Canadian Society for Civil Engineering.

The Chevron Standard Scholarship in Engineering

Field of study: Chemical, Mechanical, or Mineral Engineering.
Value: $750.
Conditions: Offered annually to a student of outstanding merit who is entering the final year in one of the above Departments and who is interested in oil exploration or production. Preference will be given to a male Canadian citizen.

The Dow Chemical Scholarship.

Field of study: Chemical Engineering.
Value: $750 plus a grant of $250 to the Department.
Conditions: Offered annually to a student of outstanding merit entering fourth year Chemical Engineering on the basis of academic record in the third year and interest in the Chemical Engineering Club and in student affairs generally.
Donor: Dow Chemical of Canada, Limited.

The Leonard E. Gads Memorial Scholarship

Field of study: Civil Engineering.
Value: $500.
Number: 1.
Conditions: Awarded to the student who, in the opinion of the survey school instructors, has shown the best overall performance in the survey courses, Civil Engineering 350 and 351.
Donor: Mrs. Louise Gads, in memory of her late husband Professor Leonard Gads, former Associate Dean of the Faculty of Engineering.

The Gas Company Scholarships

Value: $500 each.
Number: 2.
Conditions: Offered annually on the basis of academic standing and financial need to students entering second or third year.
Donor: Northwestern Utilities Limited.
Apply: Administrator of Student Awards by June 1.

The General Motors of Canada Limited Scholarship

Field of study: Engineering or Business Administration.
Value: $1,000.
Number: 2.
Conditions: Applicants must have a minimum grade point average of 7.5. Students must also be entering their penultimate or last year of study. Applicants must have career objectives applicable to the automotive industry. Recipients must serve an internship with GM during the summer after the year in which the award is payable.
Donor: General Motors of Canada Limited.
Apply: Administrator of Student Awards.

The Gerald A. Glatz Memorial Prize

Field of study: Mechanical Engineering.
Value: A Certificate.
Number: 1.
Conditions: Awarded for the best student paper presented to the Edmonton Section of the Canadian Society for Mechanical Engineering.
Donor: The Edmonton Section of the Canadian Society for Mechanical Engineering.

The Sam J. Gorman Memorial Bursary in Engineering

Value: $500.
Conditions: Offered to a student who has completed the second year of Engineering on the basis of academic standing and financial need.
Donor: Endowed by the family of the late Samuel J. Gorman.
Apply: Administrator of Student Awards by June 1.

The Inland Cement Industries Ltd. Scholarship

Field of study: Civil Engineering.
Value: $600.
Conditions: Offered annually to a student of outstanding merit entering the fourth year of Civil Engineering. The award is based on the academic standing of a full normal third year which must be not less than 7.0.

The Douglas Farquhar Johnston Bursaries in Engineering

Field of study: Mineral Engineering.
Value: $1,000 each.
Number: 5.
Conditions: Offered annually to students entering the third or fourth year in Mineral Engineering. Awards will be based on academic standing and financial need. If there are no suitable candidates entering fourth year, those entering third year may be considered.
Donor: Endowed by the late Mr. Johnston.

The Kaiser Oil Ltd. Scholarships

Field of study: Science, Engineering and Business Administration.
Value: $500.
Number: 2.
Conditions: To be awarded annually to students entering the third year of Science, Engineering or Business Administration on the basis of academic standing and financial need.
Donor: Kaiser Oil Ltd., Calgary, Alberta.
Apply: Administrator of Student Awards by June 1.

The Dunc Larbalestier Memorial Bursary

Field of study: Civil Engineering.
Value: $200.
Number: 1.
Conditions: Awarded annually to a student entering second year of Civil Engineering. The award is based mainly on financial need however academic attainment is considered.
Donor: Endowed by the Dunc Larbalestier Memorial Fund of Lions International, Edmonton District.
Apply: Administrator of Student Awards by June 1.

The John Alexander McDougall Memorial Scholarship

Field of study: Civil Engineering.
Value: $750.
Conditions: Offered annually to a student of outstanding merit entering the fourth year of Civil Engineering, based on the work of the third year.
Donor: McDougall and Secord Limited in memory of John Alexander McDougall, a member of the first Senate of the University.

The Nowsco Well Service Ltd. Scholarship

Value: $500.
Conditions: Awarded to a student on the basis of academic standing and financial need entering the second or third year of the Faculty.
Apply: Administrator of Student Awards by June 1.

The Nu-West Development Corporation Limited Scholarship

Field of study: Civil Engineering.
Value: $750.
Number: 1.
Conditions: Offered annually to a student entering third or fourth year of the Civil Engineering program on the basis of academic standing and financial need. Candidates must be Canadian citizens or Permanent Residents (Landed Immigrants).
Donor: Nu-West Development Corporation Limited.
Apply: Administrator of Student Awards by June 1.

The Petro-Canada Scholarship in Petroleum Engineering

Field of study: Chemical, Mechanical or Mineral Engineering.
Value: $500.
Number: 1.
Conditions: Awarded annually on the basis of academic attainment to a student entering third year or fourth year Chemical, Mechanical or Mineral Engineering. Students in Mineral Engineering must be taking a Petroleum specialization. Candidate must be a Canadian citizen who has resided in any of the four Western provinces for the preceding two years. There is also a possibility of summer employment with Petro-Canada.
Donor: Petro-Canada, Calgary, Alberta.

The J. M. Sharpe Memorial Prizes

Field of study: Electrical Engineering.
Value: $150 each.
Number: 2.
Conditions: One prize to be awarded to a student of outstanding merit in each of the two optional routes of study in the third year of the Department of Electrical Engineering.
Donor: Electrical Equipment (Alberta) Ltd.

The Sherritt Gordon Mines Limited Scholarship

Field of study: Chemical Engineering.
Value: $600.
Conditions: Awarded annually to a student of outstanding merit entering fourth year Chemical Engineering.

The Sherritt Gordon Mines Limited Scholarships

Field of study: Metallurgy.
Value: $500.
Number: 2.
Conditions: Offered annually to students entering the second, third or fourth year of the Mineral Engineering program on the basis of academic standing and financial need.
Donor: Sherritt Gordon Mines Limited.

The Julian C. Smith Memorial Award

Field of study: Civil, Mechanical or Electrical Engineering.
Value: $400.
Conditions: Tenable at The University of Alberta once every third year to a third year student in one of the above Departments specializing in Energy Resources Engineering directed towards the production, transmission or distribution of electrical energy.
Donor: Julian C. Smith Memorial Fund.
Apply: Selection will be made by a Committee set up by the Dean.

The Stetson Scholarships in Agriculture and Engineering

Field of study: Agriculture (excluding Forestry) and Engineering.
Value: $3,000.
Number: Two — one award in Agriculture, and one award in Engineering.
Conditions: Awarded annually on the basis of academic attainment and financial need to students entering the third or fourth year of their program. Applicants must have been residents of Alberta for the previous five years.
Donor: The Scholarship was funded in recognition of the contribution made by Minot and Rosamond Stetson in the areas of agriculture and education in this province.
Apply: Administrator of Student Awards by June 1.

The Sunwapta Broadcasting Limited Scholarship

Field of study: Communication as related to the Broadcasting and Television Industry.
Value: $200.
Conditions: Open to students entering fourth year Electrical Engineering or Honors Physics, or entering third or fourth years in Arts who have an interest in journalism or script writing.
Donor: Dr. G. R. A. Rice.
Apply: Administrator of Student Awards by June 1.

The Underwood McLellan Ltd. Scholarship in Engineering

Field of Study: Engineering.
Value: $1,000 (Actual amount will exceed this value).
Number: One.
Conditions: To be awarded annually on the basis of outstanding academic merit to a student entering the forth year in the Faculty of Engineering.
Donor: Endowed in 1980 by a gift to the University from Underwood McLellan Ltd. of Calgary.

The Walker, Newby & Associates Ltd. Scholarship in Civil Engineering

Field of Study: Civil Engineering.
Value: $1,000 and $500
Number: Two.
Conditions: To be awarded annually in January of each year to students in Civil Engineering who have successfully completed:
Environmental Engineering I (Civ E 420) and
Environmental Engineering II (Civ E 520)
and who, in the opinion of the instructors, have shown initiative and diligence in design problems related to municipal engineering. The aim of the award is to encourage the development of proficiency in urban planning, design and construction.
Donor: G. C. Walker (Civil '50), and L. R. Newby (Civil '51), and Walker, Newby & Associates Ltd. in commemoration of their Twenty-Fifth Anniversary of practice in Alberta.

Webb Memorial Student Paper Competition.

Value: $50, $30 and $20.
Number: 3.
Conditions: Prizes awarded each year for the three best student papers written and presented to the Engineering Students' Society, at its regular meetings. Eligibility requires membership in the Society and the rules of the competition are set forth in the constitution of that body.
Donor: Engineering Students' Society.

The John Wilcox Memorial Prize

Field of study: Chemical Engineering.
Value: $100.
Conditions: Awarded annually to a student of outstanding merit, completing third year of Chemical Engineering. General ability and financial need may be considered.
Donor: Endowed by the Petroleum Engineering Class of '53 through Montreal Trust Co., Calgary.

223.8.1 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Warren W. and Ida E. Prevey Memorial Gold Medal in Home Economics

Conditions: Awarded to the graduating student with the highest academic qualifications in the work of the final two years in Home Economics.
Donor: Endowed by Dr. Esther Elizabeth Prevey in memory of her parents who believed in the values of education, especially higher education and who endowed their four children with this philosophy, all of whom graduated from The University of Alberta, two from the Faculty of Home Economics. This Gold Medal was first established in 1948.

The Amy M. Coates Memorial Gold Medal in Foods and Nutrition

Field of study: Foods and Nutrition.
Value: Gold Medal.
Number: One.
Conditions: Offered to the graduating student from the Foods and Nutrition program with the highest standing in the work of the final two years.
Donor: Mrs. Diane Enilda Peers in memory of her mother, Mrs. Amy M. Coates.

The Canadian Dietetic Association Award

Field of study: Dietetics.
Value: $300.
Number: 2 for Canada-wide competition.
Conditions: Offered to a graduating Canadian Home Economics student who is proceeding to a dietetic internship or completing an integrated internship. The student must have stood in the upper quarter of the class during the final year, must meet personal qualifications, and indicate an intention to work for at least two years in the dietetic profession.
Where tenable: Any approved institution.
Apply: Submit applications through the Dean of Home Economics to the Canadian Dietetic Association by February 1.

The Canadian National Exhibition Scholarship

Field of study: Home Economics, Agriculture, Agricultural Engineering, Veterinary Science.
Value: $600.
Number: Total of 10: one for each province. Canada-wide competition.
Where tenable: Any approved institution.
Apply: Supervisor of 4-H Home Economics and 4-H Division, Department of Agriculture, 9718-107 Street, Edmonton, T5K 2C8, by July 15.

The Russell Food Equipment Limited Scholarship

Value: $350.
Conditions: Offered annually to a student graduating from the Faculty of Home Economics who is proceeding to an M.Sc. program in Foods and Nutrition or Institution Management, or into a Dietetic Internship. Scholarship is payable when registered.
Where tenable: Any approved university or institution.

The Alberta Home Economics Association Centennial Scholarship

Value: $600.
Conditions: To be awarded to a student of outstanding merit on the basis of academic standing and financial need, who has completed the first year of a program leading to a B.Sc. in Home Economics at a university or affiliated college in Alberta and who will be enrolled in the second year of Home Economics at a university in Alberta. A minimum academic standing of grade point average 6.5 or equivalent will be required.
Donor: The Alberta Home Economics Association.
Apply: Administrator of Student Awards by June 1.

The Alberta Wheat Pool Scholarships

Value: $200 each.
Number: 4.
Conditions: One award entering each of first, second, third or fourth years of Home Economics. Applicants must have been members of 4-H Homemaking clubs.
Apply: Supervisor of 4-H Clubs, Provincial Department of Culture, Youth and Recreation, C.N. Tower Bldg., Edmonton, T5J 0K1, by August 1.

The Board of Governors Prizes in Home Economics

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta

The Calgary Home Economics Association Scholarship

Value: $250.
Number: One.
Conditions: Offered annually to a student entering second year of Home Economics on the basis of academic standing and financial need. Preference is given to students whose home residence is Calgary or within fifty miles of that city.
Donor: Calgary Home Economics Association.
Apply: Administrator of Student Awards by June 1.

The Clothing and Textiles Scholarship

Value: $200.
Conditions: Awarded annually to a student of outstanding merit entering the third year of the Clothing and Textiles program. The student must have passed all subjects and obtained an average of at least 6.5 on the work of the first two years.
Donor: Endowed anonymously.

The Grace Duggan Cook Prize

Value: $150.
Conditions: To be awarded annually to a student of outstanding merit at the end of first, second or third year in the Faculty of Home Economics in the Family Studies program.
Donor: The Edmonton Home Economics Association.

The Economics Laboratory (Canada) Limited Award

Field of study: Foods and Nutrition.
Value: $750.
Number. 1 for Canada-wide competition.
Conditions: Offered annually to a student who is enter-

ing the final year in the Foods and Nutrition program and who plans to complete dietetic internship and work in the dietetic field. Award is based on scholarship and evidence of potential for, and interest in, the dietetic profession.

Where tenable: Any Canadian faculty of Home Economics.

Apply: Applications should be submitted through the Dean of Home Economics to the Canadian Dietetic Association prior to February 1.

The Hazel McIntyre Scholarship

Value: $400.

Conditions: Offered annually to a student of outstanding merit entering third year in the Foods and Nutrition pattern, based on achievement during the first two years.

Donor: Endowed by the Edmonton Home Economics Association.

The Barbara McLaren Prize in Nutrition

Value: $100.

Conditions: To be awarded to a student of outstanding merit entering fourth year Home Economics who is specializing in the area of nutrition.

Donor: Dr. Barbara A. McLaren, Toronto.

The Mabel Patrick Scholarship

Value: $800.

Conditions: Offered annually to a student, on the basis of academic standing and financial need, entering third year, based on the academic record of the first two years (average not less than 6.5).

Donor: Endowed by the Alberta Home Economics Association.

Apply: Administrator of Student Awards by June 1.

The David Butchart Pope Scholarship

Value: $500.

Number: 3.

Conditions: Awarded annually on the basis of academic standing to students entering the fourth year. One award for each of the three programs: Clothing and Textiles, Family Studies, and Food and Nutrition. Preference will be given to rural students who are, or have been, members of farm youth organizations.

Donor: The Estate of the late David Anderson Pope, in memory of his son.

Apply: Administrator of Student Awards by June 1.

The Helen Moseson Samuel Scholarship

Value: $300.

Conditions: To be awarded annually to a student at the end of first, second or third year in the Faculty of Home Economics in the Clothing and Textiles program.

Donor: The Edmonton Home Economics Association.

The Gretta Shaw Simpson and Maimie Shaw Simpson Memorial Prize

Value: $50.

Conditions: To be awarded to the student who achieves the second highest standing in the work of the third year, provided that all courses are passed and an average of 6.5 is achieved.

Donor: Dr. Elizabeth Empey, former Dean of the Faculty of Home Economics.

The Annie Gertrude Tory Scholarship

Value: $300.

Conditions: Offered annually to a student of outstanding academic merit in the work of the second year, provided that all courses are passed and an average of at least 6.5 is obtained.

Donor: Endowed by the late Henry Marshall Tory, first President of the University, in memory of his wife.

223.9.1 UNDERGRADUATE AWARDS

The Canadian Institute of Ukranian Studies Undergraduate Scholarships

Field of study: Ukranians or Ukranians in Canada in Education, History, the Arts, the Humanities, the Library Sciences, and the Social Sciences.
Value: $1,500 for eight-month period of study; $500 for students residing at home.
Number: Ten at $1,500; scholarships of $500 to students residing at home will increase number of scholarships available; scholarships are renewable.
Conditions: Awards are intended for students interested in an undergraduate degree with a major in Ukrainian studies, consisting of a combination of at least five full courses in Ukrainian, East European, Soviet, and/or Canadian studies in a three-year Arts program and at least eight full courses in Ukrainian, East European, Soviet, and/or Canadian studies in a four-year Arts or European program. Ukrainians or Ukrainians in Canada are to be the main concern in the above courses. Candidates must be Canadian citizens or Permanent Residents (Landed Immigrants) at the time of application. Only in exceptional circumstances may an award be held concurrently with other awards.
Where tenable: Any Canadian university.
Application deadline: January 31 for the following academic year.
Apply: The Canadian Institute of Ukrainian Studies, 352 Athabasca Hall, The Unversity of Alberta, Edmonton, Alberta, T6G 2EB.

223.10.1 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Horace Harvey Gold Medal in Law

Conditions: Awarded to a graduating student for the highest standing in the work prescribed for the LL.B. degree, provided that the student obtains an average of not less than 7.0.
Donor: Endowed by the late Chief Justice of Alberta.

The George Bligh O'Connor Silver Medal in Law

Conditions: Offered to a graduating student for the second highest standing in the work prescribed for the LL.B. degree, provided that the student obtains an average of not less than 7.0.
Donor: Mrs. G. G. Farnell, in memory of her father, formerly Chief Justice of Alberta.

The James Alexander Bryce ("Sandy") Burgess Memorial Scholarship

Value: $300.
Conditions: To be offered annually to a student graduating from the Faculty of Law on the basis of academic performance and such qualities of courage and resolve as have served the candidate in surmounting formidable personal obstacles in achieving his degree.
Donor: Endowed in 1971 by classmates, teachers and other friends of the late Mr. J. A. B. Burgess, LL.B. '67, in grateful recognition of his companionship and example.

The Honourable Clinton J. Ford Shields

Number: 2.
Conditions: Awarded to each of the two third-year students who make the best argument in the finals of the annual Moot Court Competition. In addition, the names of each year's winners will be recorded on a permanent plaque, a gift of the late Chief Justice.

The four finalists are selected from those students who have presented the best arguments in the second-year Moot program. The four will compete in the two teams, the winning team to receive the shields.
Donor: The late Chief Justice of Alberta.

The National Trust Prize

Value: $150 in books.
Conditions: Offered to a student of the graduating class in Law for outstanding merit in examinations in Equity I, Equity II, Real Property II, Real Property III, and Wills and Administration, provided that an average of at least 7.0 is attained on the complete second and third years.

The Shoctor Prize in Law

Value: $250.
Conditions: Awarded to a student who has completed third year law, has maintained a satisfactory academic record and has made a significant contribution to student life at the University.
Donor: Mr. Joseph H. Shoctor, Q.C. in memory of his late parents.

The Ernest Brown Wilson Memorial Prize

Value: $100.
Conditions: Awarded annually to a student in the graduating class in Law for outstanding merit in the work prescribed for the final year of the LL.B. degree.
Donor: Endowed for 20 years, beginning in 1962, by Mrs. Wilson through the Royal Trust Company.

The Alberta Academy of Trial Lawyers Prize in Evidence

Field of Study: Law.
Value: $200.
Number: One.
Conditions: To be awarded annually to the student achieving the highest mark in the subject of Evidence.
Donor: The Alberta Academy of Trial Lawyers.

The Bennett Jones Scholarship

Field of Study: Law.
Value: $1,500.
Number: One.
Conditions: To be awarded annually to a student entering the second year of Law on the basis of outstanding academic achievement during the first year.
Where Tenable: University of Alberta.
Donor: Jones & Company Barristers & Solicitors, Calgary.

The Bishop and McKenzie Prize in Company and Commercial Law

Value: $200.
Conditions: To be awarded annually to a student completing second year Law for outstanding achievement in both Company and Commercial Law courses.
Donor: Bishop and McKenzie, Barristers and Solicitors, Edmonton.

The Board of Governors Prizes in Law

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first and second years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Board of Industrial Relations Book Prize in Labour Law

Field of Study: Labour Law.
Value: Books to the value of $250.
Number: One.
Conditions: Awarded annually to a student registered in the Faculty of law for outstanding academic merit in the field of labour law.
Where Tenable: University of Alberta.
Donor: The Board of Industrial Relations.

The John E. Brownlee Memorial Prize in Local Government Law

Value: $200.
Number: 1.
Conditions: To be awarded annually on the basis of outstanding merit in the subject of Local Government Law.
Donor: Brownlee, Fryett; Barristers and Solicitors; Edmonton.

The Laurance Y. Cairns Memorial Bursary

Value $400.
Conditions: To be offered, on the basis of academic standing and financial need, to a student entering second or third year Law.
Donor: Endowed by Mrs. L. Jean Cairns in memory of her late husband, Judge L. Y. Cairns, Chancellor of the University, 1958-1964.
Apply: Administrator of Student Awards by June 1.

The Canada Law Book Company Prizes

Value: $50 in books each.
Number: 3.
Conditions: Awarded to a student completing each of first, second and third years of Law. The books are to be selected from a list submitted by the donor, the selection to be made within six months.

The Canada Permanent Trust Company Prize

Value: $100.
Conditions: Offered annually for outstanding merit in the subject of Wills, provided that the student's general record is satisfactory to the Faculty Council.

The Carswell Prizes in Law

Value: Books to the value of $200 at the end of third year and $100 at the end of each of first and second years.
Number: 3.
Conditions: To be awarded to a student completing each of the three years of the Faculty. Books shall be selected within six months of the date of the award from a list submitted by the Company.
Donor: The Carswell Company Limited, Law Publishers.

The Cooke Shandling Prize in Contract Law

Value: $125.
Number: 1.
Conditions: Awarded annually to a student successfully completing the work prescribed in First Year Law for outstanding merit in the subject of contracts.
Donor: Cooke Shandling, Barristers and Solicitors, Edmonton.

The Patricia J. Coffman Memorial Scholarship

Value: $350.
Conditions: To be awarded annually to a student of outstanding merit entering third year of the Faculty of Law and based on the work of the second year.
Donor: Endowed by the family of the late Miss Coffman who was Librarian of the Faculty of Law 1965 to 1969.

The T. J. Costigan Prize in Torts

Value: $100.
Conditions: To be awarded annually to a student completing first year of Law for outstanding merit in the subject of Torts.
Donor: Mr. T. J. Costigan, Q.C. of Blairmore, Alberta.

The Edmonton Bar Association Prize

Value: $100 and a trophy.
Conditions: Awarded annually to the student in first year Law judged to have given the best performance in the Moot Court Competition for first year Law.

The William Gordon Egbert Scholarship in Administrative Law

Value: $300.
Conditions: Awarded annually for outstanding merit in Administrative Law.
Donor: Mr. W. G. N. Egbert, Calgary.

The Harry A. Friedman Memorial Bursary

Value: $700
Conditions: To be offered, on the basis of academic standing and financial need, to a student entering second or third year Law.
Donor: Endowed by the late Mrs. Frances Friedman in memory of her late husband.
Apply: Administrator of Student Awards by June 1.

The Harold Lawrence Hawe Bursary

Value: $5,000 per year for 3 years.
Number: 1.
Conditions: Awarded annually to a student entering first year of the Faculty of Law, on the basis of academic standing and financial need. The award will be renewable for a further two years subject to satisfactory academic standing in each year.
Donor: The Estate of the late Mrs. Anne Muriel Sarah Hawe.
Apply: Selection will be made from first year entrants.

The Raymond James Memorial Prize

Field of study: Equity.
Value: $150.
Conditions: Awarded to a student in the second or third year of Law for outstanding merit in the subject of Equity.
Donor: Endowed by the late Mrs. E. L. Fitz-Simon, LL.B. (1926), in memory of her brother.

The Faculty of Law Bursaries

Value: $600.
Number: 2.
Conditions: To be awarded annually to students entering second or third year Law on the basis of academic standing and demonstrated financial need. Should an award not be made in any given year the resulting funds may be used in the form of a student loan granted upon the discretion of the Dean or the Associate Dean.
Donor: Anonymous.
Apply: Faculty of Law Prizes and Awards Committee.

The Law Wives Club of Calgary Bursary

Field of Study: Law.
Value: $700.
Number: 1.
Conditions: To be offered annually to a second or third year Law student who has obtained his/her high school education in Calgary or district. Awarded on the basis of academic achievement and financial need.
Donor: The Law Wives Club of Calgary, Alberta.
Apply: Further information can be obtained from the Faculty of Law, University of Alberta.

The Macleod, Dixon Scholarship

Value: Tuition and fees.
Conditions: Offered annually to a student of outstanding merit entering the third year of the Faculty of Law.
Donor: The law partners of Macleod, Dixon of Calgary.

The Abe W. Miller Memorial Prize in Criminal Law

Value: $100.
Conditions: Awarded annually to a student completing first year Law for outstanding performance in the subject of Criminal Law.
Donor: The law partners of the late Abe W. Miller, Q.C.

The J. D. O. Mothersill Memorial Bursary

Value: $700.
Number: 2.
Conditions: To be offered annually to a student completing first or second year in the Faculty of Law on the basis of academic standing, financial need and contribution to the Faculty through student activities. (Students applying for this award should detail such activities.)
Donor: Endowed by members of the family of the late Mr. Mothersill, who as a student on this campus, was active in extracurricular activities.
Apply: Administrator of Student Awards by June 1.

The President's Scholarships

Field of study: Arts, Science and Law.
Value: $1,500 each.
Number: 3, one in each of above Faculties.
Conditions: To be offered on the basis of high academic standing and financial need.
Donor: Endowed in 1943 by the late Mr. Justice H. H. Parlee.
Apply: Administrator of Student Awards by June 1.

The Juris Radze Memorial Scholarship

Field of study: Criminal Law
Value: $300.
Number: 1.
Conditions: To be awarded annually to a second or third year student for outstanding academic achievement in an advanced criminal law course.
Donor: Endowed by friends of the late Juris Radze.

The Rutherford Scholarship

Field of study: Property Law
Value: $400.
Number: 1.
Conditions: Awarded annually to a student completing first year Law for high standing in the subject of Real Property.
Donor: The McLean McCuaig Foundation in honour of Doctor Hazel Elizabeth Rutherford McCuaig.

The Edward Shoctor Bursary in Law

Value: $750.
Conditions: To be offered annually on the basis of academic standing and financial need to a student entering first year of the Faculty of Law.
Donor: Endowed by the late Edward Shoctor of Edmonton.
Apply: Administrator of Student Awards by June 1.

The Shumiatcher Memorial Award in Advocacy

Value: $100.
Number: 1.
Conditions: Awarded annually to a student who shows the most outstanding ability in the field of Advocacy.
Donor: Shumiatcher and Associates, Barristers and Solicitors, Regina, Saskatchewan

The Dr. Alexander Smith, Q.C. Prize in the Subject of Contract

Value: $300.
Number: 1.
Conditions: To be awarded annually to a student successfully completing first year Law with outstanding merit in the subject of Contract.
Donor: Endowed by Dr. Alexander Smith, Q.C., Professor Emeritus of Law, of Victoria.

The Thorsteinsson and Company Prize in Taxation Law

Value: $100.
Number: 1.
Conditions: Awarded annually for outstanding merit in Law 467, Taxation, provided the student's record is otherwise satisfactory to the Faculty Council.
Donor: Thorsteinsson and Company, Barristers and Solicitors, Edmonton.

The Sydney B. Woods Memorial Prize in Constitutional Law

Value: $200.
Conditions: Awarded annually for outstanding merit in the subjects of constitutional law.
Donor: The law partners of the late Sydney B. Woods, K.C.

The Peter Yanakas Prize in Criminal Law

Value: $50.
Number: 1.
Conditions: To be awarded annually to the student achieving the highest mark in Law 404, Criminal Law and Procedure.
Donor: The late Mr. Peter Yanakas.

223.10.2 GRADUATE AWARDS IN LAW

NOTE: For other general graduate awards refer to § 224 or the Faculty of Graduate Studies and Research Calendar.

The Viscount Bennett Fellowship

Under the terms of a deed of gift to the Canadian Bar Association from the Right Honourable Viscount Bennett, P.C., K.C., LL.D., D.C.L., the Viscount Bennett Trust Fund was established to encourage a high standard of legal education, training, and ethnics. The annual income from this fund is administered by the Canadian Bar Association.

An award to a maximum of $12,000 may be paid annually to a student for graduate study at an institution of higher learning approved by the Viscount Bennett Fellowship Committee on the condition that the award be the only fellowship, scholarship or grant accepted by the winner for the graduate period.

The fellowship is open to persons of either sex who are Canadian citizens and who have graduated from an approved law school in Canada or who at the time of application are pursuing final year studies as undergraduate students at an approved law school.

Applications shall be writing to the Communications Director of the Canadian Bar Association and received not later than December 15th of the year previous to that in which the award is to be made.

For application information write the Director of Communications, Canadian Bar Association, 1700-130 Alberta Street, Ottawa, Ontario K1P 5G4.

The Viscount Bennett (Law Society of Alberta) Graduate Scholarship

$2,500 is made available from a Trust founded by the late Viscount Bennett. It is offered to graduates of the Faculty of Law, The University of Alberta, for postgraduate study in Law at The University of Alberta or at another recognized institution. Applicants should state an intent to return to Alberta following such study.

Apply to the Dean, Faculty of Law, by February 1.

The Duff-Rinfret Scholarship Programme

This is a programme offered by the Ministry of Justice in honor of Chief Justice Rinfret and provides for a scholarship to enable a graduate from a Canadian law school to undertake graduate studies in Canada. The scholarship is worth $4,500 plus tuition fees and travelling expenses and lasts for twelve months, but short renewal may be possible in some cases. Apply to the Dean, Faculty of Law, for details.

223.11.1 GENERAL UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically. Awards in Medical Laboratory Science are listed under § 223.11.14.

The Moshier Memorial Gold Medal

Conditions: Awarded to a graduating student for outstanding merit in all studies in the Faculty of Medicine, provided that an average of 7.0 or better is attained.
Donor: Endowed by the Volunteer Overseas Medical Officers' Association of Edmonton in memory of the late Lt.-Col. H. H. Moshier, M.B.

Christmas Seal Scholarship

Value: $500 plus a one year subscription to the *American Review of Respiratory Diseases.*
Number: 1.
Conditions: Awarded to a student completing the Degree of Doctor of Medicine with Distinction and showing a special interest in the respiratory area.
Donor: The Alberta Lung Association.

The Dr. Walter C. MacKenzie Award

Value: $50.
Conditions: Awarded annually to the graduating student demonstrating highest proficiency in history taking and physical examination during the student internship.
Donor: The Medical Students' Association.

The H. E. Rawlinson Medical Book Awards

Number: 2.
Conditions: Offered annually to two graduating students from the Faculty of Medicine for general excellence. Each award consists of the student's choice from the list of publications of the donor.
Donor: Lange Medical Publications of California.

The John W. Scott Honor Award

Value: Medal and a cash prize of $500.
Conditions: Offered to a student completing the final year of the. M.D. program who, over the four years of the program, has shown himself or herself to possess to an outstanding degree those qualities of scholarship, leadership, and character which may be expected to lead to a distinguished position in the medical profession. The recipient will be selected by a committee on which faculty, students and alumni will be represented. The award may be made to more than one student in any one year and may be withheld in the event that no sufficient deserving candidate is available.
Donor: Medical Alumni Association of The University of Alberta.

The Board of Governors Prizes in Medicine

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first and second years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Bristol Laboratories Book Prize

Value: $125 in books.
Conditions: To be awarded to a student completing second year in the Faculty of Medicine, based on academic standing and financial need. (It is suggested that books purchased should be in the fields of therapy and pharmacology.)
Donor: Bristol Laboratories of Canada Limited.

The Ciba-Geigy Summer Research Scholarship

Value: $1,500.
Number: 1.
Conditions: To be awarded annually to a student in the Faculty of Medicine for support of a summer research project.
Donor: Ciba-Geigy Canada Ltd.
Apply: Dean of Medicine by March 1.

The Edwin Isaac Clarke Scholarship Fund

Field of study: Ophthalmology or cancer research.
Value: $3,600 per year.
Conditions: The above sum to be available annually to the Department of Ophthalmology and the McEachern Cancer Research Laboratory. The money may be used: (a) to provide three students in these fields of study with summer research awards in the amount of $1,200 each, or (b) to provide support for students or other personnel or for the provision of materials or equipment used by such, at the discretion of the Chairman of the Department, or the Director of the Laboratory.
Donor: Endowed by the will of the late Mrs. Jean E. Clarke in memory of Mr. E. I. Clarke.
Apply: Dean of Medicine by March 1.

The College of Physicians and Surgeons of Alberta Bursaries

Value: A number of awards totalling $1,200.
Number: Variable.
Conditions: To be offered to students on the basis of academic standing and financial need, completing either first or second year in the Faculty of Medicine. The value of each award shall not be more than $600 or less than $300.
Apply: Administrator of Student Awards by June 1.

The Henry Anton Deutsch Medical Summer Research Award

Value: $3,200.
Conditions: To be awarded annually on the basis of academic merit to a medical student to support a summer research project or for work towards an M.Sc. or Ph.D. degree.
Donor: The Estate of Henry Anton Deutsch.
Apply: The Dean of Medicine by March 1.

The Mary Fong Bursary

Value: About $500 each.
Number: 2.
Conditions: To be awarded to students, on the basis of academic standing and financial need, completing either first, second or third year in the Faculty of Medicine.
Donor: Endowed by Dr. Amy Fong Wong, in memory of her mother, Mrs. Mary Fong.
Apply: Administrator of Student Awards by June 1.

The Charles E. Frosst Medical Bursary

Value: $500.
Conditions: To be offered to a student completing first or second year in the Faculty of Medicine and to be awarded on the basis of academic standing and financial need.
Donor: Charles E. Frosst and Co., Montreal.
Apply: Administrator of Student Awards by June 1.

The Vessie Heckbert Memorial Summer Research Award

Field of study: Cancer research.
Value: $3,200.
Conditions: Offered annually to a student in the Faculty of Medicine for support of a summer research project.
Donor: Endowed by the late S. Carl Heckbert of Vermilion, Alberta
Apply: The Dean of Medicine by March 1.

The Lange Book Awards

Value: Books.
Number: 8.
Conditions: Offered annually to two students completing Phase I, two students completing Phase II, two students completing third year, and two graduating students of the Faculty of Medicine program. The basis for selection is general excellence. Each award consists of the student's choice from the list of publications of the donor.
Donor: Lange Medical Publications of California.
Apply: By nomination of the Faculty.

The Dr. D. S. Macnab Bursary

Value: $250.
Conditions: Open to students at the end of first or second year in the Faculty of Medicine, on the basis of academic standing and financial need.
Donor: Calgary Associate Clinic.
Apply: Administrator of Student Awards by June 1.

The Merck Sharp and Dohme Scholarship in Therapeutics

Field of study: Therapeutics.
Value: $500 plus a copy of the current edition of the Merck Manual.
Number: 1.
Conditions: To be awarded annually to a third or fourth year student who in the opinion of the Faculty Awards Committee has shown outstanding performance, ability or interest in the general field of Therapeutics.
Donor: Merck Sharp and Dohme Canada Ltd.

The Kenneth William Moodie Bursary

Value: $700.
Conditions: Offered annually to a student entering the first year of the Faculty of Medicine on the basis of academic attainment in the previous year's work and financial need.
Donor: Endowed by the late Miss Marion E. Moodie in memory of her nephew, Flying Officer K. W. Moodie, a graduate of this University who lost his life in 1942, while on operations.
Apply: Selection will be made from first year entrants.

The C. V. Mosby Book Awards

Value: $50 in books each.
Number: 3.
Conditions: Awarded annually to three students of outstanding merit in the Faculty of Medicine.
Donor: C. V. Mosby Company.

The Dr. A. J. Pauly Bursaries in Medicine

Value: $600 each.
Number: Variable.
Conditions: To be awarded to students who will be entering the Faculty of Medicine, on the basis of academic standing and financial need.
Donor: Endowed by the late Dr. Pauly (through the National Trust Co., Montreal).
Apply: Selection will be made from first year entrants.

The Dr. Allan Coates Rankin Award

Value: $500.
Conditions: Awarded annually to the most deserving and outstanding student completing any year of the Faculty of Medicine, on the basis of academic standing and financial need.
Donor: Endowed by the late Dean Rankin.

The David and Beatrice Reidford Research Scholarship

Field of study: New methods in the provision of health care.
Value: $3,200.
Number: 2.
Conditions: Offered annually to a student in the Faculty of Medicine, for support of a summer research project.
Donor: Endowed by the Estate of the late David Reidford.
Apply: The Dean of Medicine, by March 1.

The Research Fellowship of the College of Physicians and Surgeons of Alberta

Value: $1,800, plus fees for the succeeding year in the Faculty of Medicine.
Conditions:

(1) It shall be granted at the completion of the first or second year in Medicine, tenable for one year and renewable for a further period.

(2) The research shall be carried out in one of the basic sciences.

(3) It shall only be granted when in the opinion of the Medical Faculty they have a student who from the standpoint of ability and aptitude is worthy of this scholarship.

(4) From time to time the College shall be advised of the nature of the work being carried out and its progress.

In the event that no suitable person is available in any one year the award may be made to two medical students as two undergraduate medical research summer awards in the amount of $1,200 each.

Apply: The Dean of Medicine by March 1.

The Edna Wakefield Rowe Memorial Summer Research Award

Value: $1,200.
Conditions: Available to a medical student to support a summer research project, with preference given to cancer research.
Donor: The estate of the late Mildred R. Weston.
Apply: Dean of Medicine by March 1.

The Searle Research Scholarship

Value: $1,650.
Number: 1.
Conditions: Offered annually to a student in the Faculty of Medicine for support of a summer research project in the field of Pharmacology or Therapeutics.
Donor: G. D. Searle and Co. of Canada Limited.
Apply: The Dean of Medicine by March 1.

The Dr. R. F. Shaner Memorial Gold Medal

Conditions: Awarded annually to a graduating student on the basis of contribution to the Medical Students' Association throughout all four years of medicine, without reference to academic standing.
Donor: The Medical Students' Association.

The Donald A. Stafford Memorial Scholarship in Cancer Research

Field of Study: Medicine.
Value: $100.
Number: One.
Conditions: To be awarded annually to a student for outstanding merit in the area of cancer research.
Donor: Mrs. Doris Stafford & Family of Wainwright, Alberta.
Apply: By nomination.

The Dorothy Jean Usher Memorial Summer Research Award

Value: $1,000.
Conditions: Available to a student in the Faculty of Medicine for support of a summer research project in medicine, with preference to the study of leukaemia.
Donor: Endowed by Mr. and Mrs. Thos. Usher of Scollard, Alberta.
Apply: Dean of Medicine by March 1.

The Dr. J. W. Young Memorial Bursary

Value: $1,000.
Conditions: To be offered to a student entering first year Medicine, on the basis of academic standing and financial need.
Donor: Endowed through the will of the late Mrs. Young in memory of her husband.
Apply: Selection will be made from first year entrants.

223.11.2 ANATOMY

The Dr. R. F. Shaner Prize in Anatomy

Value: $400.
Conditions: To be awarded annually to a student completing Phase I of the M.D. program for outstanding merit in histology and gross anatomy.
Donor: Endowed by the Medical Alumni Association.

223.11.3 BACTERIOLOGY

The Allan Coates Rankin Prize in Bacteriology

Value: $75.
Conditions: Awarded to a medical student for outstanding merit in Bacteriology, provided that at least a grade of 7 is obtained in this course, and that all of the subjects of that year are taken and passed.
Donor: Rankin Medical Journal Reporting Club.

223.11.4 BIOCHEMISTRY

The Hugh and Mabel McAfee Memorial Scholarship

Value: $350.
Conditions: Offered annually to a student or students of outstanding merit in Biochemistry in the first year of Medicine, provided the student's record is otherwise satisfactory. The award may be divided at the discretion of the Faculty.
Donor: Endowed by Mrs. L. B. Pett, of Ottawa, in memory of her parents.

223.11.5 COMMUNITY MEDICINE

The College of Family Physicians Bursary — Alberta Chapter

Value: $200.
Conditions: To be awarded to a student in third year Faculty of Medicine for outstanding merit in the study of Family Medicine.
Donor: College of Family Physicians (Alberta Chapter).

The Dr. M. E. Ledingham Memorial Summer Research Award

Value: $3,200.
Conditions: Available to a medical student to support a summer research project, with preference to work in the field of Continuing Medical Education.
Donor: Endowed by the late Dr. M. E. Ledingham of Calgary.
Apply: Dean of Medicine by March 1.

223.11.6 MEDICINE

Dr. Joseph Dvorkin Memorial Fund Travel Award

Value: Equivalent to the cost of travel, registration and living expenses incurred in attending a meeting or course in Cardiology in Canada.
Number: 1.(Undergraduate)
Conditions: Awarded annually on results of student's academic performance in courses in cardiology in Phase II. The meeting/course may be attended at any time in Phase III.
Donor: Dr. Joseph Dvorkin Memorial Fund of the University of Alberta Hospital.

The Adella Patrige Memorial Award in Cardiology

Field of study: Cardiology.
Value: $300.
Number: 1.
Conditions: Offered annually to a student in, or graduating from, Phase III of the medical program whose interests are in Cardiology or Cardiac Surgery. Preference may be given to a student from the Camrose area or a graduate of the Camrose Lutheran College.
Donor: Endowed by the family and friends of the late Mrs. Adella Patrige.

The E. L. Pope Memorial Award in Medicine

Value: $250 and a scroll.
Conditions: Offered annually to a graduating student for outstanding merit in Medicine, provided that the average in the courses in Medicine is 7.0 or more.
Donor: Edmonton Academy of Medicine.

The Percy H. Sprague Prize in Medicine

Value: $150.
Conditions: Offered annually to a third or fourth year student for outstanding merit in Internal Medicine.
Donor: Alberta Society of Specialists in Internal Medicine.

223.11.7 OBSTETRICS AND GYNAECOLOGY

The Conn Memorial Gold Medal in Obstetrics and Gynaecology

Conditions: Offered annually to a graduating student for outstanding merit in Obstetrics and Gynaecology, provided that the grade point average of the student in the courses in these subjects is 7.0 or better.
Donor: Endowed by Mr. Geoffrey H. Wood.

The Dr. James Richard Leeder Prize in Obstetrics and Gynaecology

Field of study: Obstetrics and Gynaecology.
Value: $100.
Number: 1.
Conditions: Offered annually to a third year student showing outstanding promise in Obstetrics and Gynaecology.
Donor: Edmonton Society of Obstetrics and Gynaecology.

223.11.8 OPHTHALMOLOGY

The Rose Bogoch Prize in Ophthalmology

Value: $100.
Number: 1.
Conditions: Awarded annually to a graduating student from the Faculty of Medicine for clinical excellence in Ophthalmology.
Donor: Mrs. Manuel Bogoch of Edmonton.

The Dr. Ernest A. Johnson Prize in Ophthalmology

Value: $350.
Conditions: Awarded annually to a student graduating from the Faculty of Medicine for outstanding merit in the courses in Ophthalmology.
Donor: Endowed by Dr. Ernest A. Johnson of Calgary.

223.11.9 PAEDIATRICS

The Douglas Leitch Gold Medal in Paediatrics

Conditions: Awarded annually to a graduating student in the Faculty of Medicine for outstanding merit in Paediatrics.
Donor: Endowed by the Alberta Paediatric Society.

223.11.10 PATHOLOGY

The John James Ower Gold Medal and Scholarship in Pathology

Value: A gold medal and $400.
Conditions: Awarded annually to a graduating student for outstanding merit in Pathology. If there is no suitable candidate no award will be made.
Donor: Endowed by the Medical Alumni and friends and colleagues of the late Dr. Ower, through the Alumni Association.

The Dr. M. Viola Rae Prize in Pathology

Value: $100.
Conditions: To be awarded to a student in the Faculty of Medicine for outstanding merit in the course in General Pathology.
Donor: Endowed by Dr. M. Viola Rae of White Rock, B.C.

The Isaac and Leah Weinlos Prize in Pathology

Value: $150.
Conditions: Awarded annually to a student for outstanding merit in the course in General Pathology.
Donor: Endowed by Dr. and Mrs. Morris Weinlos and daughters.

223.11.11 PHYSIOLOGY

The A. W. Downs Prize in Physiology

Value: $180 cash to be used towards the purchase of a medical instrument to be selected by the Department.
Conditions: Awarded annually to the medical student who obtains the highest marks in the course in Physiology in the first year provided that a grade of 7 or better is obtained and that all subjects are passed.
Donor: Endowed by Dr. W. J. Downs and the Medical Alumni Association.

223.11.12 PSYCHIATRY

The Dr. S. S. Spaner Prize in Psychiatry

Value: $150.
Conditions: Awarded annually to a fourth year student for outstanding merit in Psychiatry provided his or her record is otherwise satisfactory.
Donor: Endowed by Mr. F. J. Cameron of Calgary.

223.11.13 SURGERY

A.E. Bowie Scholarship in Medicine

Value: $300.
Number: 1.
Conditions: To be awarded annually on the basis of academic attainment to a graduating student showing particular interest in diseases of the ear or intending to specialize in that field.
Donor: Miss Iva Smith of Edmonton.

The Dr. H. H. Hepburn Memorial Prize in Surgery

Value: $700.
Conditions: To be awarded annually to a student graduating from the Faculty of Medicine. The selection for the award is to be based on academic standing, demonstrated clinical competence in surgery and surgical subspecialties, participation in extracurricular activities and on those personal qualities which would contribute to an outstanding professional career.
Donor: Endowed by Dr. Allan L. Hepburn of Calgary in memory of his late father.
Apply: Selection will be made by the Faculty.

The Mewburn Memorial Gold Medal in Surgery

Conditions: Offered annually to a graduating student for outstanding merit in Surgery, provided that the grade point average in such courses is 7.0 or better.
Donor: The Department of Surgery.

The Surgical Research Prize

Value: $50.
Conditions: Awarded to a third or fourth year student for the best manuscript submitted on an original Surgical Research topic. For details regarding the manuscript, applicants may contact the members of the Department of Surgery.
Apply: Manuscripts must be submitted to the Dean of Medicine by March 31. They should be typed, double spaced, not exceeding 25 pages and accompanied by any references or bibliography.

The Isaac and Leah Weinlos Scholarship in Surgery

Value: $600.
Conditions: Awarded annually to a student for outstanding achievement in third and fourth year Surgery provided that the student's record is otherwise satisfactory.
Donor: Endowed by Dr. and Mrs. Morris Weinlos and daughters.

223.11.14 MEDICAL LABORATORY SCIENCE

NOTE: Awards to graduating students are listed first. All other awards are listed alphabetically.

The B. Motyl Prize

Value: $250.
Number: 1.
Conditions: Awarded annually to a graduating student on the basis of academic standing, general proficiency and extra-curricular activities.
Donor: Endowed by M.L.S. alumni and friends of Mrs. Motyl.

The University of Alberta Hospital Laboratory Medicine Staff Award

Field of Study: Medical Laboratory Science.
Value: $150.
Number: One.
Conditions: To be awarded annually to the student graduating with the highest distinction from the B.Sc. program in Medical Laboratory Science.
Donor: Endowed by the University of Alberta Hospital Laboratory Medicine Staff.

The Alberta Society of Laboratory Physicians Prize in M.L.S.

Value: $100.
Conditions: Offered annually to a student of outstanding merit completing the second year of the Medical Laboratory Science program.

The Board of Governors Prizes in Medical Laboratory Science

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Program. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Harper & Row Book Award in Clinical Chemistry

Field of Study: Medical Laboratory Science (Clinical Chemistry)
Value: $50.00 in books.
Number: One.
Conditions: Student's choice from the list of publications of the donor; offered annually to the student with the highest standing in Clinical Chemistry in the third year of the Medical Laboratory Science program, provided that the student's record is otherwise satisfactory.
Donor: Harper & Row, Publishers, Inc. Hagerstown, Maryland.

The Harper & Row Book Award in Microbiology

Field of Study: Medical Laboratory Science (Microbiology)
Value: $50.00 in books.
Number: One.
Conditions: Student's choice from the list of publications of the donor; offered annually to the student with the highest standing in Microbiology in the third year of the Medical Laboratory Science program, provided that the student's record is otherwise satisfactory.
Donor: Harper & Row, Publishers, Inc. Hagerstown, Maryland.

The Ortho Diagnostics Prize

Value: A certificate and $50.
Conditions: Awarded to the student with the highest standing in Hematology and Immunohematology in the third year of the Medical Laboratory Science program, provided that the student's record is otherwise satisfactory.
Donor: Ortho Diagnostics, Don Mills, Ontario.

The Technicon Book Prize in Medical Laboratory Science

Field of Study: Medical Laboratory Science.
Value: $50.00 in books.
Number: One.
Conditions: To be awarded annually to a student of outstanding merit completing the third year of the Medical Laboratory Science program.
Donor: Technicon International of Canada Ltd.

The W. B. Saunders Book Award

Field of Study: Medical Laboratory Science.
Value: $50.00 in books.
Number: One.
Conditions: Student's choice from the list of publications of the donor; offered annually to the student with the highest average in the three M.L.S. courses in the second year.
Donor: W. B. Saunders Company Canada Limited, Toronto, Ontario.

The University Hospital Medical Staff Prize

Value: $100.
Conditions: Offered annually to the student completing the third year of the Medical Laboratory Science program, who has attained the highest proficiency during the hospital year.

223.11.15 GRADUATE AWARDS IN MEDICINE

NOTE: For other general graduate awards refer to § 224 of the Awards Calendar or the Faculty of Graduate Studies and Research Calendar.

Dr. Joseph Dvorkin Memorial Fund Travel Award

Value: Equivalent to the cost of travel, registration and living expenses incurred in attending a meeting or course in Cardiology in Canada.
Number: 1 (Graduate).
Conditions: Awarded annually after recommendation from the Director, Division of Cardiology, University Hospital and the Committee of the Dr. Joseph Dvorkin Memorial Fund. The meeting/course may be attended any time during the recipient's graduate training after the award is made.
Donor: Dr. Joseph Dvorkin Memorial Fund of The University of Alberta Hospital.

The Medical Research Council of Canada Awards

Studentships of $6,750 are available from the Council for highly qualified holders of a B.Sc. to do Master's or Ph.D. work in a basic science in a department of a Faculty of Medicine, Pharmacy or Dentistry.

Holders of a professional degree, or of a Ph.D. degree in a basic science, may apply under the Council's fellowship program for further training or research.

Further information may be obtained from the Dean's office. All applications are to be forwarded to the Secretary, Medical Research Council, Montreal Road, Ottawa K1A 0R6, Canada.

The Percy Hermant Fellowships in Ophthalmology

Two awards of $1,500 each will be offered annually by Imperial Optical Company to medical graduates of a Canadian university for further study in Ophthalmology at The University of Alberta, or at another approved institution. Applicants must indicate an intention to subsequently practice this speciality in Canada.

Apply to Chairman, Department of Ophthalmology, The University of Alberta, Edmonton T6G 2E1, by March 1.

The Dr. Sidney Spaner Memorial Award in Psychiatry

An award of $800 will be offered annually in the Clinical Graduate Training Program to an outstanding trainee proceeding towards the Specialty in Psychiatry. Normally the award will be made at the end of the second year of the program.

Endowed by Mrs. Sylvia Spaner and friends of the late Dr. S. Spaner.

Selection will be made by the Faculty of Medicine.

223.12 Faculty of Nursing

223.12.1 MATRICULATION AWARDS

The P.E.O. Memorial Prize

Value: $100.

Conditions: To be awarded to a student from an Alberta high school who will be entering the B.Sc. in Nursing program at The University of Alberta.

Donor: The Edmonton Chapters of the P.E.O. Sisterhood.

Apply: Administrator of Student Awards by July 15th.

223.12.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The McClure Gold Medal in Nursing

Conditions: Awarded annually to the student graduating from the Basic program for the Bachelor of Science degree in Nursing who has shown the highest degree of academic attainment in the final year of the program.

Donor: Endowed by friends of Miss R. E. McClure.

The Alberta Association of Registered Nurses, Edmonton Chapter #7, Book Prize

Value: $50 book certificate.

Conditions: To be awarded to the student graduating with outstanding merit from the degree program for Registered Nurses.

Donor: Alberta Association of Registered Nurses Edmonton Chapter #7.

Apply: Mrs. Jean Gibson, 9907-145 Street, Edmonton, Alberta, T5N 2X2.

A.E. Bowie Scholarship in Nursing

Value: $300.

Number: 1.

Conditions: Offered to a student, completing the final year of the Post-RN Bachelor of Science in Nursing program who, over the two years of the program has been shown to possess qualities of scholarship and leadership which may contribute to the advancement of the profession of nursing. The recipient will be selected by a committee composed of Post-Basic Nursing faculty and students. The award may be withheld in the event that no sufficiently deserving candidate is available.

Donor: Miss Iva Smith of Edmonton.

The McClure Book Prize

Value: $125.

Number: 1.

Conditions: Awarded annually to the student graduating from the Advanced Practical Obstetrics Program who has shown the highest degree of academic attainment and clinical proficiency.

Donor: Endowed by friends of Miss R.E. McClure.

The Faculty of Medicine Book Prize in Nursing

Value: Books.

Conditions: To be awarded to a graduating student from the B.Sc. Nursing four year degree program for outstanding merit based on both academic standing (grade point average not less than 7.0) and a proficiency in Nursing

Donor: The Faculty of Medicine from funds provided to the Faculty by Mr. J. B. Starky of Edmonton.

The Cheryl Lynn Osborne Memorial Scholarship in Nursing

Field of Study: Nursing.
Value: $250.
Number: One.
Conditions: To be awarded annually to a student graduating from the four year B.Sc. Nursing program. Selection will be made on the basis of high academic achievement, dedication to the nursing profession and possession of those personal qualities valued by the Faculty of Nursing in its graduates.
Donor: Endowed by Mr. Brent Osborne in memory of his late wife, Cheryl Lynn, a graduate of the B.Sc. Nursing program at the University of Alberta.

The Molly Policha Scholarship in Public Health Nursing Practice

Field of Study: Nursing.
Value: $250.
Number: One.
Conditions: To be awarded annually on the basis of outstanding academic merit to a student graduating from the Post-RN Bachelor of Science in Nursing program.
Donor: Endowed by friends of Molly Policha.

The W. B. Saunders Company Prize in Nursing

Value: One year's subscription to "Nursing Clinics of North America".
Conditions: Awarded annually to a student of outstanding merit graduating from the B.Sc. Nursing four year degree program.
Donor: W. B. Saunders Company Limited, Publishers, Toronto, Canada.

The Board of Governors Prizes in Nursing

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award. Such a prize may also be awarded to the student with the highest academic standing at the end of the first year of the two year program for B.Sc. Nursing after R.N.
Donor: The Escheated Estates Fund of The University of Alberta.

The Andrew Anderson Memorial Prizes in Nursing

Value: $150 each.
Number: 2.
Conditions: To be awarded to two students completing the third year of the B.Sc. program in Nursing. The award will be based on academic standing and outstanding personal service in the care of patients during the clinical training period.
Donor: Miss R. K. Hamilton of Edmonton, in memory of the late Andrew Anderson.

The Marjorie Bradford Awards in Nursing

Value: One scholarship of $300, two bursaries of $500 each.
Conditions: (1) A scholarship of $300 to be awarded to a student of outstanding merit at the end of the first year of the degree program for Registered Nurses. (2) Two bursaries of $500 to be offered on the basis of academic standing and financial need, to students at the end of the first year of the B.Sc. Nursing program.
Donor: Endowed through a bequest by the late Marjorie Bradford of Ottawa.
Apply: Applications for the bursary to be made to the Administrator of Student Awards by June 1.

Christmas Seal Scholarship

Value: $500.
Number: 2.
Conditions: Awarded annually on the basis of academic standing and community service to students with a special interest in the respiratory area. One award to a student at the end of the third year of the B.Sc. program in Nursing and one award to a student at the end of the first year of the two year program for B.Sc. Nursing after R.N.
Donor: The Alberta Lung Association.

The Helen MacArthur Prize in Nursing

Value: $150.
Conditions: Offered to a student of outstanding academic merit completing the first year of the degree program for Registered Nurses.
Donor: The Friends of the University.

The Nursing Undergraduate Society Prize

Value: $150.
Number: 1.
Conditions: To be awarded to an undergraduate student in either the Basic or Post-Basic B.Sc. Nursing program. Basis of the prize will be participation in nursing related activities, both within the Faculty and the community.
Donor: The University of Alberta, Nursing Undergraduate Society.
Apply: Applications to be submitted in writing, stating qualifications, by February 28th to the President of N.U.S.

The Ian Kurtis Osborne Memorial Scholarship in Nursing

Field of Study: Nursing.
Value: $250.
Number: One.
Conditions: To be awarded annually on the basis of high academic standing, financial need, and personal qualities to a student completing the third year of the B.Sc. Nursing program.
Donor: Endowed by Mr. Brent Osborne in memory of his late son, Ian Kurtis, whose mother, the late Cheryl Lynn Osborne, was a graduate of the B.Sc. Nursing program at the University of Alberta.

The Eleanor J. Shook Memorial Bursaries in Nursing

Value: $800.
Number: 3.
Conditions: To be offered, on the basis of academic standing and financial need to students in the B.Sc. program of The University of Alberta Faculty of Nursing.
Donor: Endowed through a bequest by the late Eleanor J. Shook.
Apply: Administrator of Student Awards by June 1.

Victorian Order of Nurses Bursaries

Field of study: Community Health Preparation.
Value: Up to $2,500.
Conditions: May be awarded to nurses enrolled at a Ca-

nadian university in a diploma course in community health nursing or in the final year of a basic or post-basic degree program. Awards carry an employment commitment of one year to the V.O.N.

Apply: National Director, Victorian Order of Nurses for Canada, 5 Blackburn Avenue, Ottawa, Ontario K1N 8A2.

Alberta Association of Registered Nurses

There are other forms of financial assistance available to students in Nursing. For information contact the Alberta Association of Registered Nurses, 10256 - 112 Street, Edmonton.

The Way / Roberts Scholarship in Nursing

Field of Study: Nursing.
Value: $500.
Number: One.
Conditions: To be awarded annually to a student entering the senior year of the post-basic B.Sc. Nursing program. The award will be made on the basis of a satisfactory academic record, to a student with a minimum of at least five years experience as a registered nurse.
Where Tenable: University of Alberta.
Donor: Mr. and Mrs. Barry Way of Turner Valley, Alberta.

223.12.3 GRADUATE AWARDS IN NURSING

NOTE: For other general graduate awards refer to § 224 of the Awards Calendar, or the Faculty of Graduate Studies and Research Calendar.

Professional Training Grants

Return in-service financial assistance is available to graduate nurses pursuing postgraduate study in any field of nursing. Application should be made to the Director, Staff Development, Alberta Social Services and Community Health, 9945-108 Street, Edmonton, Alberta.

The University of Alberta Hospital Graduate Scholarship in recognition of Fiftieth Anniversary of the School of Nursing

Value: $1,000.
Number: 1.
Conditions: Awarded to a graduate of the University of Alberta Hospital who has been accepted in a University program for advanced study relevant to Nursing, at the Baccalaureate, Masters or Doctoral level.
Where tenable: Any recognized university.
Donor: The University of Alberta Hospital Board.
Apply: Vice-President — Nursing, University of Alberta Hospital, Edmonton, Alberta T6G 2B7.

223.13 Faculty of Pharmacy and Pharmaceutical Sciences

223.13.1 MATRICULATION AWARDS

The Dr. Art Anderson Scholarship

Value: $250.
Conditions: Award will be based on the standing in the required subjects of Grade XII. The student must have attended Grade XII in that part of Alberta south of a line from Rocky Mountain House to Red Deer to Coronation but not including these centres.
Donor: The Calgary Pharmaceutical Society.
Apply: Administrator of Student Awards by July 15.

The Edmonton Society of Pharmacists Scholarship

Value: $200.
Conditions: Awarded annually to a student of outstanding merit on the required Grade XII subjects. The student must have carried out the work of Grade XII in that part of Alberta north of a line from Rocky Mountain House to Red Deer to Coronation and including those centres.
Apply: Administrator of Student Awards by July 15.

223.13.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Alberta Pharmaceutical Association Gold Medal

Value: A gold medal plus full cost of registration in the Association.
Conditions: The gold medal is awarded to the most outstanding student in the graduating class.

The Alberta Pharmaceutical Association Awards

Value: As below.
Number: 4.
Conditions: Offered as follows:

(1) $100 scholarship for outstanding merit in the subjects of the first year, provided that a grade of 5 or better is obtained in each,

(2) $100 scholarship on similar terms for the second year,

(3) a five-year subscription to The Practical Pharmacy Edition of the "Journal of The American Pharmaceutical Association" for outstanding merit in the third year dispensing course, and

(4) the cost of registration with the Alberta Pharmaceutical Association for outstanding merit in Pharmaceutical Marketing and Management courses, provided that the student's record is otherwise acceptable.

The Horner Medal and Award

Value: $200 cash and silver medal.
Number: 1.
Conditions: Offered annually to a student of outstanding merit in Pharmacy 487 and 488 (Pharmaceutical Therapeutics).
Donor: Frank W. Horner Limited.

The Board of Governors Prizes in Pharmacy

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The Burroughs Wellcome Prizes

Value: $125 each.
Number: 2.
Conditions: To be awarded to two students, one entering second year and one entering third year, based on courses in Pharmacy in the preceding year.
Donor: Burroughs Wellcome and Co. (Canada) Ltd.

The Centennial Pharmacy Travel Award

Value: Two weeks travel plus $400.
Conditions: The award will cover two weeks travel to visit laboratories and manufacturing facilities and to attend the Canadian Pharmaceutical Association Convention in May of each year. In addition, this Association and the Alberta Pharmaceutical Association will each provide $200. A student in third year in the Faculty of Pharmacy will be selected on the basis of academic standing and contribution to student activities.

Selection will be made in February by the Faculty.

The Charles Cummer Memorial Prize

Value: $100.
Conditions: Offered to a student of outstanding merit entering the second, third or fourth year of the Faculty.
Donor: Endowed by the late Mrs. Sarah A. Cummer of Edmonton.

The Edmonton and District Ladies' Pharmaceutical Auxiliary Prize

Value: $200.
Conditions: Offered annually on the basis of academic standing to a student entering third or fourth year Pharmacy.

The Film Services (Alberta) Limited Scholarship

Value: $500.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering second, third or the final year Pharmacy.
Apply: Administrator of Student Awards by June 1.

The Charles E. Frosst Scholarship

Value: $250.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering second, third or the final year of the Faculty of Pharmacy.
Donor: Charles E. Frosst and Company, Montreal.
Apply: Administrator of Student Awards by June 1.

The Mervyn J. Huston Scholarship in Pharmacy

Value: $500.
Conditions: To be awarded annually to a student entering the final year of the B.Sc. program in Pharmacy on the basis of outstanding academic merit and contributions to the life and endeavors of the Pharmacy Undergraduate Society.
Donor: The Alberta Pharmaceutical Association.
Apply: Selection of the recipient will be by the Faculty of Pharmacy in the spring of each year.

The Merck Sharp and Dohme Scholarship

Value: $250. plus the Merck Manual and Merck Index.
Number: 1.
Conditions: Offered annually on the basis of academic standing to a student entering third year of the Faculty of Pharmacy.
Donor: Merck, Sharp and Dohme Canada, Limited.

The Shipley Scholarship

Value: $300.
Conditions: Offered on the basis of academic standing and financial need to a student entering second, third or fourth year of the Faculty of Pharmacy.
Donor: Shipley Photo Services, Limited, of Calgary and Edmonton.
Apply: Administrator of Student Awards by June 1.

The Upjohn Company of Canada Scholarship

Value: $300.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering second, third or fourth year Pharmacy.
Apply: Administrator of Student Awards by June 1.

The G. R. Van Petten Memorial Scholarship

Field of Study: Pharmacology.
Value:
Number: One.
Conditions: To be awarded annually to a student registered in the Faculty of Pharmacy who attained the highest academic standing in Pharmacology 431.
Donor: Endowed by Friends and Associates of the late Garry Van Petten.

The M. J. Warner Memorial Prize

Value: $100.
Conditions: To be awarded to a student entering fourth year, based on courses in Pharmacy in the preceding year.
Donor: The Alberta Pharmaceutical Association.

223.13.3 GRADUATE AWARDS

NOTE: For other general graduate awards refer to § 224 of the Awards Calendar or the Graduate Studies and Research Calendar.

The Pfizer Research Scholarship

$300, is offered annually to an outstanding graduate of The University of Alberta who is undertaking graduate work in the Faculty.

Selection will be made by the Faculty.

The Warner-Lambert Park-Davis Pharmacy Research Fellowship

$1,600 is offered annually to a student of outstanding merit undertaking graduate work in Pharmacy at The University of Alberta. A supplementary grant of $400 for equipment and supplies will also be made to the Faculty of Pharmacy. A recipient must be a Canadian citizen or a Permanent Resident (Landed Immigrant).

Selection will be made by the Faculty.

The Medical Research Council of Canada Awards

Studentships are available from the Council for highly qualified holders of a B.Sc. to do Master's or Ph.D. work in a basic science in a department of a Faculty of Medicine, Pharmacy or Dentistry.

Holders of a Professional degree, or of a Ph.D. degree in a basic science, may apply under the Council's fellowship program for further training or research.

Further information may be obtained from the Dean's office. All applications are to be forwarded to the Secretary, Medical Research Council, Montreal Road, Ottawa, Ontario K1A 0R6.

223.14 Faculty of Physical Education and Recreation

223.14.1 MATRICULATION AWARDS

The Edmonton Sportsman's Fund Bursary

Value: $500.
Conditions: To be offered annually to a student from an Edmonton high school entering first year of the Faculty of Physical Education and Recreation. The award will be based on academic standing, financial need and participation in athletics in high school.
Donor: The Edmonton Sportsman's Fund Inc.
Apply: Administrator of Student Awards by July 15.

223.14.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The University of Alberta Alumni Gold Medal in Physical Education and Recreation

Conditions: Offered to the outstanding graduating student in Physical Education and Recreation, provided that the student has been registered in a full year's program and has obtained an average of at least 7.0 in the final year.
Donor: The Alumni Association of The University of Alberta.

The Atomic Interprovincial Transportation System Ltd. Bursary

Value: $200.
Conditions: Offered annually to a student completing first year on the basis of academic standing and financial need.
Donor: Atomic Interprovincial Transportation System Ltd. of Winnipeg.
Apply: Administrator of Student Awards by June 1.

The Board of Governors Prizes in Physical Education and Recreation

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

The J. K. Campbell and Associates Limited Scholarship

Value: $300.
Conditions: Awarded annually to a student of outstanding academic merit entering the third or fourth year of the Faculty.

Janie Larsen Memorial Prizes

Value: $200 each.
Number: 2.
Conditions: Open to students registered in the first or second years of the B.A. degree in Recreation Administration. One scholarship will be awarded to a first year student proceeding to second year and one scholarship to a second year student proceeding to third year. Scholarships will be awarded on the basis of contribution to student life on campus and academic standing.

Donor: Stan, Maxine Larsen and family.
Apply: The Chairman, Department of Recreation Administration by April 1.

Margie Mitchell Memorial Prize

Value: $200.
Conditions: To be awarded annually to an undergraduate student entering the final full year of studies towards a Bachelor of Arts degree in Recreation Administration. The award shall be based upon; academic achievement, contribution to and involvement with the Recreation Students' Society and Recreation Administration students in general, and financial need.
Donors: The Recreation Students' Society and private donors.
Apply: The President, Recreation Students' Society, Faculty of Physical Education and Recreation by April 1.

The Royal Canadian Legion, Alberta Command, Bursaries in Physical Education and Recreation

Value: $200 each.
Number: 2.
Conditions: Offered to students entering third or fourth year of the Faculty, on the basis of academic standing and financial need.
Donor: The Royal Canadian Legion, Alberta Command.
Apply: Administrator of Student Awards by June 1.

223.15 Faculty of Rehabilitation Medicine

223.15.1 MATRICULATION AWARDS

The Canadian Foundation for Poliomyelitis and Rehabilitation (Alberta Chapter) Bursaries

Value: $300 each.
Number: 4.
Conditions: Awarded annually to applicants entering the first, second, third and fourth year of Rehabilitation Medicine. The basis of the award will be academic standing and financial need. It is expected that recipients will carry on their profession in Alberta for a reasonable period after graduation.
Donor: The Royal Canadian Legion.
Apply: Administrator of Student Awards — undergraduates by June 1 or matriculants by July 15.

The Oil Service Charitable Organization Bursary

Value: $500.
Number: 2.
Conditions: Offered annually on the basis of academic standing and financial need to a student entering first year of the Rehabilitation Medicine Program. Preference will be given to students from Alberta and Saskatchewan.
Donor: Endowed by the Oil Service Charitable Organization (1964-1976).
Apply: Administrator of Student Awards by July 15.

223.15.2 UNDERGRADUATE AWARDS

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

The Occupational Therapy Book Prize

Value: $25 in books.
Conditions: Offered annually to the student obtaining the highest standing in the final year of the B.Sc. program in Occupational Therapy, provided that his or her record is otherwise satisfactory.
Donor: The Alberta Association of Registered Occupational Therapists.

The Canadian Association of Occupational Therapists Book Prize

Value: $25 in books.
Conditions: To be awarded to the graduating student who has achieved the highest standing in the theory of occupational therapy during the entire program.
Donor: The Canadian Association of Occupational Therapists

Canadian Physiotherapy Association Book Prize

Field of study: Physiotherapy
Value: $30 in books
Number: 1.
Conditions: To be awarded to the physiotherapy student in the graduating class who has obtained the highest aggregate mark in academic and clinical physiotherapy subjects during the entire program.
Donor: The Canadian Physiotherapy Association.

The Madeline Pierson Memorial Book Prize in Occupational Therapy

Value: $25.
Conditions: Offered annually to the final year student who obtains the highest mark in Psychiatry, providing that his or her record is otherwise satisfactory throughout the program.
Donor: The Calgary Branch of the Alberta Association of Registered Occupational Therapists.

The Speech Pathology and Audiology Book Prize

Field of study: Speech Pathology.
Value: $15 book prize.
Number: 1.
Conditions: Awarded to the student who displays the highest academic and clinical achievements in the Department of Speech Pathology and Audiology during the fourth year.
Donor: The Speech and Hearing Association of Alberta.
Apply: Selection will be made by a faculty committee and presentation will be made directly by donor..

The Alberta Association of Registered Occupational Therapists Bursary

Field of Study: Occupational Therapy.
Value: $500.
Number: One.
Conditions: To be awarded annually to a mature student registered in the third or fourth year of the Undergraduate program of Occupational Therapy. The award will be based on financial need and acceptable academic standing of the applicant.
Donor: Alberta Association of Registered Occupational Therapists.
Apply: Awards Committee, Alberta Association of Registered Occupational Therapists Occupational Therapy Department Corbett Hall, University of Alberta.

Association of Chartered Physiotherapists of Alberta Scholarship

Field of study: Physiotherapy.
Value: $559.
Number: 1.
Conditions: To be awarded to the student with the highest aggregate marks in all physiotherapy subjects in the first year of the program. The student must be proceeding into a full time second year of study in physiotherapy.
Donor: Association of Chartered Physiotherapists of Alberta.

The Board of Governors Prizes in Rehabilitation Medicine

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of the University of Alberta.

Calgary District Canadian Physiotherapy Association Scholarship

Field of study: Physiotherapy.
Value: Tuition and fees.
Number: 1.
Conditions: To be awarded to the student who has most improved academically during the third year of the Physiotherapy program.
Donor: Calgary District, Canadian Physiotherapy Association.

The Canadian Foundation for Poliomyelitis and Rehabilitation (Alberta Chapter) Bursaries

Value: $300 each.
Number: 4.
Conditions: Awarded annually to applicants entering the first, second, third or fourth year of Rehabilitation Medicine. The basis of the award will be academic standing and financial need. It is expected that recipients will carry on their profession in Alberta for a reasonable period after graduation.
Donor: The Royal Canadian Legion.
Apply: Administrator of Student Awards — undergraduates by June 1 or matriculants by July 15.

Edmonton Barbershop Chorus Prizes in Speech Pathology

Field of study: Speech Pathology.
Value: $100 each.
Number: 3.
Conditions: Awarded annually to the student with the highest academic standing in Speech Pathology at the end of each of the second, third and fourth years.
Donor: Klondike Chordsmen Chorus of the Society for the Preservation and Encouragement of Barbershop Quartet Singing in America, Edmonton Chapter.
Apply: Selection will be made by a faculty committee.

Edmonton District Canadian Physiotherapy Scholarship

Field of study: Physiotherapy.
Value: Tuition and fees.
Number: 1.
Conditions: To be awarded to the student with the highest aggregate marks in the second year of the physiotherapy program. The student must be proceeding into a full-time third year of study in physiotherapy.
Donor: Edmonton District, Canadian Physiotherapy Association.

The Dr. J. R. Fowler Book Prize

Value: Book prize of value of $65.
Conditions: To be awarded to a student in Occupational Therapy or Physiotherapy on the basis of academic standing, personal qualities and contribution to the Faculty during the undergraduate years.
Donor: Endowed by Dr. J. R. Fowler, former Director.
Apply: Selection will be made by a joint student and faculty committee.

The E. W. Kuder Scholarship in Rehabilitation Medicine

Field of study: Occupational Therapy or Physical Therapy.
Value: $700 plus a pin.
Number: 1.
Conditions: To be awarded annually to a student in the field of Occupational Therapy or Physical Therapy who is returning to The University of Alberta for either degree completion or graduate study. The selection will be based on the student's overall academic performance in the undergraduate program in Occupational or Physical Therapy. Preference will be given to a student who has worked for at least one year in a rural area.

Donor: Emil William Kuder and family of Edmonton.
Apply: Dean of the Faculty of Rehabilitation Medicine, Corbett Hall, University of Alberta by August 1.

The Occupational Therapy Prize

Field of study: Occupational Therapy.
Value: $30.
Number: 1.
Conditions: Awarded to a graduating student for outstanding fieldwork achievement throughout the program.
Donor: Alberta Association of Registered Occupational Therapists.
Apply: Selection will be made by the Alberta Association of Registered Occupational Therapists in consultation with a faculty committee. Presentation will be made directly by donor.

The Red Deer Elks Lodge Scholarship

Field of study: Speech Pathology and Audiology.
Value: $250.
Number: 2.
Conditions: Awarded annually to students entering the fourth year of Speech Pathology and Audiology. The basis for selection will be academic standing and extra-curricular participation in the area of Speech Pathology and Audiology.
Donor: Red Deer Elks Lodge No. 85, Red Deer, Alberta.

223.16 Faculté Saint-Jean

223.16.1 UNDERGRADUATE AWARDS

The Board of Governors Prizes for Faculté Saint-Jean

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculté. If two or more students are equal for first place, each will receive a full award.
Donor: The Escheated Estates Fund of The University of Alberta.

223.17.1 MATRICULATION AWARDS

The Walter A. Crawford Memorial Bursaries

Field of study: Agriculture and Geology.
Value: $1,000 each.
Number: One in each of Agriculture and Geology.
Conditions: To be offered to two students entering first year at The University of Alberta; one in Agriculture and one in Geology. The awards will be based on academic standing and financial need.
Donor: Endowed through the will of the late Walter A. Crawford of Edmonton.
Apply: Administrator of Student Awards by July 15.

The Hudson's Bay Oil and Gas Company Limited Bursary in Geology

Value: $1,000 per year for up to four years.
Conditions: Awarded to a student entering first year in a program in Geology, on the basis of academic standing and financial need. A new award will be made on the completion of the preceding one.
Apply: Administrator of Student Awards by July 15.

Trans Mountain Oil Pipe Line Company Scholarships

Field of Study: Engineering or the Physical Sciences.
Value: $300 each plus a grant-in-aid to the University.
Number: 4.
Conditions: Offered to students whose homes are along the route of the Trans Mountain Pipe Line in Alberta from Edmonton west to the provincial boundary. Preference will be given to students from outside the city of Edmonton. Financial need may be taken into consideration.
Apply: Administrator of Student Awards by July 15.

223.17.2 UNDERGRADUATE AWARDS

NOTE: Awards in specific courses offered by the Faculty of Science are open to any student taking the course, regardless of the faculty in which a student may be registered.

NOTE: Gold medals and awards to graduating students are listed first. All other awards are listed alphabetically.

GENERAL AWARDS

The Lieutenant-Governor's Gold Medal

Conditions: Awarded to the graduating student from an honors program in the Faculty of Science who has shown the highest distinction in scholarship.
Donor: His Honour the Lieutenant-Governor.

The Dean's Gold Medal in Science

Conditions: Awarded to the graduating student from the general program in the Faculty of Science who has shown the highest distinction in scholarship.
Donor: The Dean of Science.

The Dean's Gold Medal in Science (Specialization)

Field of Study: Science.
Value: Gold Medal.
Number: One.
Conditions: Awarded to the graduating student from the General program or from a Specialization program in the Faculty of Science who has shown the highest distinction in scholarship.
Donor: Dean, Faculty of Science.

The Board of Governors Prizes in Science

Value: $100 each.
Conditions: To be awarded to the student with the highest academic average at the end of each of the first, second and third years of the Faculty. If two or more students are equal for first place, each will receive a full award. Students in a graduating year of a program are not eligible.
Donor: The Escheated Estates Fund of The University of Alberta.

The James McCrie Douglas Memorial Scholarship

Value: $700.
Number: 2.
Conditions: Awarded annually on the basis of academic standing and financial need to a student entering fourth year of an honors program.
Donor: Endowed by the late James McCrie Douglas of Edmonton.
Apply: Administrator of Student Awards by June 1.

The Kaiser Oil Ltd. Scholarships

Field of study: Science, Engineering and Business Administration.
Value: $500.
Number: 2.
Conditions: To be awarded annually to students entering the third year of Science, Engineering or Business Administration on the basis of academic standing and financial need.
Donor: Kaiser Oil Ltd., Calgary, Alberta.
Apply: Administrator of Student Awards by June 1.

The President's Scholarship

Field of study: Arts, Science and Law.
Value: $1,500 each.
Number: 3, one in each of the above Faculties.
Conditions: To be offered on the basis of high academic standing and financial need.
Donor: Endowed in 1943 by the late Mr. Justice H. H. Parlee.
Apply: Administrator of Student Awards by June 1.

The Renkenberger Scholarship

Field of study: Agriculture and Forestry, Arts, Science, Education or Business Administration and Commerce.
Value: $250.
Conditions: Awarded to an undergraduate student who is especially interested in co-operative marketing. Basis of the award will be academic standing and participation in relevant extracurricular activities.
Donor: Bequest of the late Harvey Renkenberger of Barons, Alberta.
Apply: Administrator of Student Awards by June 1.

The Frederick A. Scherrer Bursaries

Field of study: Arts and Science.
Value: $300 each.
Number: 4, two in each of the above faculties.
Conditions: To be offered on the basis of academic standing and financial need.
Donor: Endowed by the late Dr. F. A. Scherrer.
Apply: Administrator of Student Awards by June 1.

The Sunwapta Broadcasting Limited Scholarship

Field of study: Communications as related to the broadcasting and television industry.
Value: $200.
Conditions: Open to students entering fourth year Electrical Engineering or Honors Physics, or entering third or fourth years in Arts who have an interest in journalism or script writing.
Donor: Dr. G. R. A. Rice.
Apply: Administrator of Student Awards by June 1.

BOTANY

The J. E. Olsen Prize in Botany

Value: $35.
Conditions: Offered to the graduating student in the Botany pattern who has achieved the highest average mark in two or more senior botany courses, provided that the student's general record is satisfactory to the Science Faculty Council.

CHEMISTRY

The Professor Osman James Walker Memorial Scholarship

Value: $600.
Conditions: Awarded annually to a graduating student selected by the Department who will be proceeding to graduate work in the Department of Chemistry at The University of Alberta. In the event that no suitable applicant is selected, the award will go to the student with the highest record in the fourth year of the Honors Chemistry program.
Donor: Endowed by friends of the late Professor Walker, a former head of the Department.
Apply: Department Chairman by May 1.

The Society of Chemical Industry Merit Awards

Field of study: Biochemistry, Chemistry and Chemical Engineering.
Value: A gold key and a year's subscription to "Chemistry and Industry".
Number: 3.
Conditions: Awards will be made to the student graduating with the highest standing in each of Honors Biochemistry, Chemistry and Chemical Engineering provided an average of 7.0 is attained in the final year, and that the program has been completed in the normal number of years.

The Allied Chemical Canada Ltd. Scholarship in the Chemical Sciences

Field of study: Chemical Engineering or Honors Chemistry.
Value: $750.
Conditions: To be awarded annually to a student of outstanding academic merit entering the final year of either Chemical Engineering or Honors Chemistry. Personal qualities and participation in extracurricular activities are also to be considered.
Donor: Allied Chemical Canada, Ltd.

The Chemical Institute of Canada Prize in Chemistry

Value: $25 and a silver medal.
Conditions: Awarded to the student who obtains the highest standing in the work of third year Honors Chemistry provided that such student's record is otherwise satisfactory to the Science Faculty Council.

The Fred H. Irwin Memorial Prize in Organic Chemistry

Value: $120 book prize.
Conditions: Awarded to the student making the best record in Chemistry 550.
Donor: Mr. and Mrs. Leslie H. Irwin in memory of their son, Flying Officer F. H. Irwin, who lost his life March 19, 1945, while on operations.

The Lehmann Prize in Chemistry

Value: $200 in books.
Conditions: Awarded to the student making the best record in Chemistry 202, provided such student's record is otherwise satisfactory to the Faculty Council.
Donor: Estate of the late Dr. A. L. F. Lehmann, formerly Head of the Department.

The Herbert E. Morris Scholarship in Chemistry

Value: $450.
Conditions: To be awarded to a student of outstanding merit entering final year of the Honors Chemistry or Chemistry Specialization program.
Donor: Endowed by Mrs. Morris in memory of her husband, a graduate of this University.

COMPUTING SCIENCE

The Donald B. Scott Memorial Prize in Computing Science

Value: $250.
Number: 1.
Conditions: Offered annually to a student on entering fourth year of the program in Computing Science, on the basis of academic attainment and personal qualities of the individual.
Donor: The Edmonton Section of the Canadian Information Processing Society.

GEOGRAPHY

The Canadian Association of Geographers Book Prize

Conditions: Award is granted annually to the graduating student who has specialized in Geography and who has demonstrated the greatest proficiency in this subject.

The J. H. Holloway Memorial Scholarship in Survey Science

Field of study: Geography (Survey Science).
Value: $500.
Number: 1.
Conditions: Offered annually to a student entering the fourth year in the Department of Geography, for outstanding academic merit in survey science.
Donor: The Alberta Land Surveyors' Association J.H. Holloway Scholarship Foundation.

Alberta Geography Prizes

Value: $50.
Number: 3.
Conditions: Awarded (1) to the freshman student receiving the highest mark in Geography 230 and 231, (2) to the second year student who has shown the greatest proficiency in Geography, and (3) to the third year student who has shown the greatest proficiency in Geography. In all cases the student's work must be otherwise satisfactory.
Donor: Mr. Donald C. Lofquist, M.A.

GEOLOGY

The APEGGA Gold Medal in Geology

Conditions: Awarded to the student graduating from either the general or honors program in Geology with the highest standing in the final year provided this is at least 7.0.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The William R. Scott Memorial Prize in Economic Geology

Field of study: Economic geology.
Value: $75 in books.
Number: 1.
Condtions: To be awarded annually to an outstanding graduating student on the basis of excellence in economic geology.
Donor: Endowed by friends of the late William R. Scott.

The APEGGA John A. Allan Memorial Scholarship in Geology

Value: Tuition and fees.
Conditions: Offered annually to a student who obtains the highest standing in all the prescribed courses of first year geology.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta in memory of Professor John A. Allan.

The APEGGA Scholarships in Geophysics

Value: Tuition and fees.
Conditions: Offered annually to a student of outstanding merit entering the third or fourth year of Honors Geophysics or Specialization in Geophysics.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The Cactus Drilling Corp. Ltd. Bursary.

Field of study: Geology or Engineering.
Value: $500.
Conditions: Offered to a student entering final year of the general or honors program in Geology or final year Engineering on the basis of academic standing, financial need and contribution to extracurricular student activities.
Apply: Administrator of Student Awards by June 1.

The Dr. Neil Campbell Memorial Scholarship

Value: Tuition and fees.
Number: 1.
Conditions: Offered annually on the basis of academic attainment to a student entering the fourth year of Honors Geology.
Donor: Friends of the late Dr. Neil Campbell.

The Canada-Cities Service Limited Bursary

Field of study: Geology or Engineering.
Value: $500.
Conditions: Offered annually to a student entering fourth year in Honors Geology or Engineering who has indicated an interest in the petroleum field of study. Basis of award will be academic standing and financial need.
Apply: Administrator of Student Awards by June 1.

The Chevron Standard Limited Scholarship in Geology

Value: $1,000.
Conditions: Offered to a student of outstanding merit entering the final year of Honors Geology who is interested in oil exploration or production.
Apply: Canadian Society of Exploration Geophysicists, P.O. Box 117, Calgary, Alberta by March 15.

The Chevron Standard Limited Scholarship in Geophysics

Value: $1,000.
Conditions: Offered to a student of outstanding merit entering third or fourth year of Honors Geology and Physics or Honors Physics (Geophysics option) and who is interested in oil exploration or production.

The Bill Elder Scholarships in Geology

Value: $1,000.
Number: 2.
Conditions: Offered on the basis of academic standing and financial need at the end of the first, second or third years of either the Honors or Specialization in Geology programs.
Donor: Anonymous.

The Petro-Canada Scholarship in Geology

Field of study: Geology or Geology and Physics.
Value: $500.
Number: 1.
Conditions: Awarded annually on the basis of academic attainment to a student entering third or fourth year of the B.Sc. Hons. Geology or Geology and Physics. Candidate must be a Canadian citizen who has resided in any of the four Western Provinces for the preceding two years. There is also a possibility of summer employment with Petro- Canada.
Donor: Petro-Canada, Calgary, Alberta.

The Thomas Payne Memorial Prize in Economic Geology

Value: $200.
Conditions: Offered annually to the student obtaining the highest standing in Geology 532, provided that the student obtains a grade of at least 7 in that subject and has been registered in a full program.
Donor: Endowed by the family and friends of the late Mr. Payne.

The Suncor Scholarship in Geology

Value: $500.
Conditions: To be awarded to the student in the Honors or Specialization program in Geology who has the highest standing at the end of the second year of the program. The award is renewable for a second year, subject to satisfactory academic standing, and a new award will, therefore, normally be made only every other year.
Donor: Suncor Inc., Calgary.

The P. S. Warren Prize in Geology

Value: $150.
Conditions: Awarded to a non-graduating student for outstanding achievement in Geology 201, provided the student's record is otherwise satisfactory.
Donor: Endowed by the Edmonton Geological Society.

The P. S. Warren Memorial Prize in Earth History

Value: $300.
Conditions: To be awarded annually to a non-graduating student either in Honors Geology or majoring in Geology, for outstanding achievement in the field of Earth History.
Donor: Endowed by Mrs. R. B. Ferguson of Winnipeg and Mrs. J. E. Campbell of Edmonton, in memory of their father, Dr. P. S. Warren, former Head of the Department of Geology, whose particular interest was in the study of Earth History.

MATHEMATICS

The Ernest Wilson Sheldon Memorial Prize in Mathematics

Value: $300.
Conditions: Awarded to a student of outstanding merit completing third year of the honors program in Mathematics. The award will be based on performance in the mathematics courses of the third year.
Donor: Endowed by Mrs. Sheldon in memory of the late Dr. E. W. Sheldon, Emeritus Professor of Mathematics.

The J. W. Campbell Memorial Prize in Mathematics

Value: $175.
Conditions: Awarded annually to a student of outstanding merit in Mathematics 207 and 208, provided that the student's record is otherwise satisfactory to the Faculty Council.
Donor: Endowed by Mrs. J. W. Campbell in memory of her husband, former Head of the Department of Mathematics.

PHYSICS

The APEGGA Gold Medal in Geophysics

Conditions: Offered to a student with the highest standing in the final year of Geophysics, provided that grade-point average of at least 7.0 is attained.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The Louis S. Crosby Memorial Gold Medal in Physics

Conditions: Awarded annually to the student obtaining the highest standing in the final year of Honors Physics (Pure Physics program), provided that the student has carried a full year's work and obtained a grade-point average of at least 7.0.
Donor: The family of the late Mr. Crosby.

The APEGGA Scholarship in Geophysics

Value: Tuition and fees.
Conditions: Offered annually to a student of outstanding merit entering the third or fourth year of Honors Geophysics or Specialization in Geophysics.
Donor: The Association of Professional Engineers, Geologists and Geophysicists of Alberta.

The Jane-Ann Robertson Memorial Scholarship in Physics.

Value: $300.
Number: 1.
Conditions: To be awarded annually on the basis of outstanding merit to a student entering the second year of the Honors Physics program. Consideration will be given to the personal qualities of the individual. Recipients must be Canadian citizens.
Donor: The family and friends of the late Jane-Ann Robertson.

The Society of Exploration Geophysicists Scholarships

Field of study: Geophysics.
Value: $500 each.
Number: 4 for Canada.
Conditions: Open to Canadian students majoring in Geophysics. The awards will be based on academic standing and financial need and are open to matriculants, undergraduates or graduate students.
Where tenable: Any university in Canada.
Apply: Application forms may be secured from Canadian Society of Exploration Geophysicists Scholarship Sub-Committee, P.O. Box 117, Calgary, Alberta and should be returned completed to the same address by March 15.

PSYCHOLOGY

See under the Departments of the Faculty of Arts.

ZOOLOGY

The Bamfield Marine Station Scholarship

Field of study: Marine Biology.
Value: $500.
Number: 1.
Conditions: To be awarded annually to a University of Alberta student who will be attending spring or summer courses at Bamfield Marine Station. Selection is made on the basis of academic standing and financial need.
Where tenable: Bamfield Marine Station.
Donor: Escheated Estates Fund of the University of Alberta.
Apply: Apply in writing to the Chairman, Department of Zoology by May 1, and arrange to provide one reference letter from a university professor and an official university transcript.

The William Rowan Memorial Prize

Value: $200.
Conditions: Offered annually to a student of outstanding merit entering fourth year of the Honors Zoology program.
Donor: Endowed by friends of the late Dr. Rowan, former Head of the Department.

The Max and Marjorie Ward Scholarship

Field of study: Wildlife Biology of the North.
Value: $500.
Number: 2.
Conditions: Open to graduate and undergraduate students working in the field of wildlife biology of the north; to be used in support of summer research. When conditions warrant the same student can have both awards, totalling $1,000.
Donor: Endowed by friends of Max and Marjorie Ward.
Apply: Chairman, Department of Zoology by April 1.

224 AWARDS IN THE FACULTY OF GRADUATE STUDIES AND RESEARCH

224.1 General Information

The following Scholarships and Fellowships are awarded primarily on the basis of academic standing. In general, awards are made only to applicants whose previous academic standing is either First Class or high Second Class. Students admitted to the "Qualifying year" are not eligible for scholarships or fellowships.

Unless otherwise stated, awards are for one year only, but application for renewal will be considered in open competition. No award will be made to other than a full-time student. Unless otherwise stated, awards are tenable only at The University of Alberta.

Unless the terms specify otherwise, awards of less than $3,000 will be paid over the eight-month academic term beginning September 1. Awards of more than $3,000 will be paid over twelve months starting May 1 or September 1.

In order that awards may be equitably distributed no student may hold more than one major award in a given year. A major award is defined generally as $3,000 or more for eight months or $4,000 for twelve months. Holders of major awards may accept, in addition, minor awards up to a maximum of $1,000.

Holders of major awards may not accept a teaching or other assignment involving more than the equivalent of eight hours per week during the academic session or a total of 200 hours during a twelve-month period. This is generally considered to be a two-third assistantship or its equivalent. It may be spread over the full 12 months or may be concentrated in any part of the 12 month period. Notwithstanding the above, holders of major awards must not be prohibited from matching the income of a full G.Ap. by combining a part G.Ap., where applicable, with a major award, provided that the donor agency regulations allow this. Holders of Dissertation Fellowships may not accept any such duties.

Holders of awards must pay regular tuition fees unless otherwise stated.

All Fellowships, Scholarships, Assistantships etc. are subject to Canadian Income Tax.

224.2 Awards

The University of Alberta Graduate Fellowship

Value: $7,500.
Conditions: This is the senior fellowship within the Faculty and is open to students who have completed at least one year of graduate study and register for a full-time doctoral program. The recipient is expected to carry out a full-time research program during the summer months. Tenure to begin May 1 or September 1.
Donor: The Escheated Estates Fund of The University of Alberta.
Apply: Administrator of Student Awards by February 1.

Alberta Egg and Fowl Marketing Board Scholarship

Field of Study: Poultry Science.
Value: $2,500.
Number: One.
Conditions: To be awarded to a student who is undertaking research in the field of Poultry Science.
Apply: Department of Animal Science by October 1.

The Alberta Government Telephones Centennial Fellowship

Field of study: Telecommunications.
Value: $6,000.
Conditions: Offered annually to a graduate in Engineering, Physics, Mathematics or allied fields from a university in Canada to pursue a Ph.D. program in the field of telecommunications.
Apply: Administrator of Student Awards by February 1.

The Alberta Sugar Factories Limited Scholarship

Field of study: Agriculture.
Value: $500.
Conditions: Preference given to research related to irrigation farming.
Apply: Administrator of Student Awards by February 1.

AOSTRA Predoctoral Scholarships

Field of study: Development of the Oil Sands.
Value: $9,000.
Number: Variable.
Conditions: To be awarded to outstanding students registered in, or admissable to, graduate programs in fields of research related to the development of the oil sands in Alberta. There is a small research allowance connected with the award. The award may be renewed for a second year.
Donor: Alberta Oil Sands Technology and Research Authority.
Apply: Administrator of Student Awards by February 15 for awards tenable May 1 or September 1, and September 1 for awards tenable on January 1 of the next year.

The W. S. Buchanan Scholarship

Field of study: History or English.
Value: About $400.
Conditions: Awarded alternately in the Department of History and the Department of English to a graduate student of outstanding merit.
Donor: Mr. W. S. Buchanan, Winnipeg.
Apply: On nomination of Department.

The City of Edmonton Graduate Fellowship

Field of study: Economics, Geography, Political Science, Sociology, Business Administration and Commerce.
Value: $6,000.
Number: 1.
Conditions: To be awarded to graduate students at the Masters and Ph.D. level who are doing thesis work on topics dealing with public service delivery, the division of responsibilities between levels of government, capital budgeting decisions, cost/benefit relations-issues of local taxation, metropolitan fragmentation and territorial expansion, physical planning policies, and closely related matters.
Donor: The City of Edmonton.
Apply: Selection will be made by an interdepartmental committee.

The Karl A. Clark Memorial Scholarship

Field of study: M.A. program in Economics.
Value: $5,500 tenable over 12-month period.
Conditions: Preference given to research in fields of particular concern to Alberta, such as natural resources, transportation and industrial development.
Donor: The Research Council of Alberta.
Apply: Awarded on nomination of the Department of Economics.
Apply: Administrator of Student Awards by February 1.
Note: Terms and value are currently under review.

The Delta Delta Delta Alumnae Fellowship

Value: $1,500.
Conditions: Offered annually to a woman student of outstanding academic merit graduated from a degree program of The University of Alberta. Preference will be given to a student entering her first year of graduate work immediately following her undergraduate degree.
Where tenable: The University of Alberta or any other accredited university.
Apply: Administrator of Student Awards by February 1.

The Dissertation Fellowships

Value: $6,500.
Number: Variable — 20 or more.
Conditions: Designed for students who have a firm expectation of completing a doctoral program within twelve months following tenure. Tenure must begin between May 1 and January 1. Candidacy examinations must be passed before tenure begins. No other duties, teaching or otherwise, may be undertaken, and the recipient must be working full-time on his or her program.
Donor: The University of Alberta.
Apply: Awards will be made on nominations from Departments. Nominations will be called for by March 1.

The Faculty of Nursing Book Prize in Nursing

Field of study: Nursing.
Value: $50 in books.
Number: 1.
Conditions: To be awarded to a graduating student from the M.N. program for merit. (Grade point average not less than 7.0 and proficiency in nursing.)
Donor: The Faculty of Nursing 50th Anniversary Scholarship Fund.

The Faculty of Nursing M.N. Scholarship in Nursing

Field of Study: Nursing.
Value: $350.
Number: One.
Conditions: To be awarded annually to the student with the highest academic average at the end of the first year of the Master of Nursing Program.
Donor: The Faculty of Nursing 50th Anniversary Scholarship Fund.

The James Patrick Folinsbee Memorial Scholarship in Creative Writing

Value: Up to $1,000.
Number: 1 or 2 not exceeding $1,000 in total.
Conditions: To be awarded to a student (or students) of demonstrated ability in creative writing who will be entering fourth year of the Honors English program or any year of a graduate program in English. Also open to students from elsewhere who are entering a graduate program in English at The University of Alberta.
Donor: Endowed by the late Dr. F. J. Folinsbee.
Apply: To Chairman of the Department by June 1.

The Izaak Walton Killam Memorial Scholarships

Field of study: Any except "the Arts" as defined in the Canada Council Act.
Value: $9,000
Number: About 8.
Conditions: Offered to outstanding students registered in, or admissible to, a doctoral program. Applicants must have completed at least one year of graduate work before start of tenure. Granted initially for two years (subject to review after the first year), they may be renewed for up to one further year. Tenure to begin May 1 or September 1. There is also a possible maximum $750 research grant over the full tenure of the award.
Donor: The estate of Mrs. Dorothy J. Killam.
Apply: Administrator of Student Awards by February 1.

The Luscar Limited Graduate Scholarship

Field of study: Mineral Engineering.
Value: $5,580.
Number: 1.
Conditions: Offered annually to a graduate student in Mining Engineering.
Donor: Luscar Limited.
Apply: By nomination of the Department of Mineral Engineering to Luscar Limited.

The Elizabeth Russell MacEachran Scholarship

Field of study: Home Economics.
Value: $6,000.
Conditions: To be offered annually for graduate study in Home Economics, preferably in the field of Foods and Nutrition.
Donor: Endowed by the late Dr. J. M. MacEachran in memory of his wife who was the first dietitian of the University residences.
Apply: Administrator of Student Awards by February 1.

The J. R. H. Hall Graduate Scholarship in Forestry

Field of study: Forestry.
Value: Tuition and fees.
Number: 1.
Conditions: Offered annually to a student entering or continuing in a program of graduate studies in the field of forestry. The basis of award is academic merit and financial need. Preference may be given to students born in Alberta.
Donor: Endowed by Herbert and Jeanette Hall.
Apply: By nomination of the Department of Forest Science.

The Harold Hayward Parlee Memorial Fellowship

Value: $3,600.
Conditions: Open to students who have completed one year of graduate study. Recipient is expected to carry out a full-time research program during the summer months. Tenure to begin May 1 or September 1.
Donor: The Winspear Foundation, in memory of H. H. Parlee, Chairman of the Board of Governors of The University of Alberta from 1940 to 1950.
Apply: Administrator of Student Awards by February 1.

The Library Association of Alberta Prizes

Value: $100.
Number: 2.
Conditions: To be awarded annually on the basis of evidence of professional potential and outstanding performance in the Faculty of Library Science courses.
Donor: The Library Association of Alberta Bulletin.

The Dr. G. Pannu Prize

Value: $50.
Conditions: To be awarded annually to a student (or students) in the Faculty of Library Science for highest standing in the study of "organization of information."
Donor: Members of the Faculty of Library Science in memory of the late Dr. Gurdial Pannu, a former member of the staff.

The Pfizer Research Scholarship

Field of study: Pharmacy.
Value: $300.
Conditions: Offered annually to a graduate of The University of Alberta who is undertaking graduate work in the Faculty.
Apply: Awarded on recommendation of the Faculty.

Province of Alberta Graduate Fellowships

Value: $7,200.
Number: Variable — about 20.
Conditions: Open to students who have completed at least one year of graduate study and register for a full-time doctoral program. Recipients are expected to carry out a full-time research program during the summer months. Tenure to begin May 1 or September 1. The usual award is for twelve months. They may be terminated earlier by either the student or the University and the amount reduced proportionately. Applicants must be Canadian citizens or Permanent Residents (Landed Immigrants) at the date of application.
Donor: The Government of the Province of Alberta.
Apply: Administrator of Student Awards by February 1.

Province of Alberta Graduate Scholarships

Value: Up to $6,000.
Number: Variable — About 40.
Conditions: Normally open to all students registered in graduate studies except in a "qualifying year." The usual award is for twelve months, but partial awards may be recommended at a reduced value. They may be terminated earlier by either the student or the University and the amount reduced proportionately. Tenure to begin May 1 or September 1. Applicants must be Canadian citizens or Permanent Residents (Landed Immigrants) at the date of application.
Donor: The Government of the Province of Alberta.
Apply: The Administrator of Student Awards by February 1.

The William Rea Scholarship

Value: $2,000.
Number: 2.
Conditions: Offered annually to a University of Alberta graduate or graduating student who shows the best aptitude in terms of scholarship and extracurricular activity for a career in drama, music or writing.
Where tenable: Any accredited university.
Donor: William Rea, Jr., in honor of his father, a pioneer Edmonton educator.
Apply: Administrator of Student Awards by February 1.

The Sarah Reed Gold Medal in Library Science

Conditions: To be awarded annually to the graduate student best demonstrating academic excellence and professional promise in Library Science.

The Sarah Rebecca Reed Memorial Scholarship in Library Science.

Field of study: Library Science.
Value: $1,200.
Number: 1.
Conditions: Offered annually to a student entering the second year of the Master of Library Science program. Preference may be given to a student who is a graduate of a B.L.S. program and has worked as a librarian.
Donor: Endowed by the late Sarah Rebecca Reed, founding Director, and supplemented by donations.

The J.R. Schrumm Memorial History Prize

Field of study: History.
Value: 100.
Conditions: The prize is to be given for the best paper presented in History 570 (the Graduate Canadian Bibliographical Seminar), written by a student registered in the Masters program in Canadian History.
Donor: Endowed by CUPE Broadcast Division Local 684, CBC staff and friends, U of A History Department members, Amisk Waskahegan Chapter Historical Society of Alberta.

The Mary Alice Scott Book Prize

Value: $50 in books.
Conditions: To be awarded to the student making the best record in Library Science 442, provided the student secures a standing otherwise satisfactory to the Council of the Faculty of Library Science.
Donor: The Association of Professional Librarians of The University of Alberta

The Flore Shaw Graduate Scholarship in Music

Value: $3,000.
Conditions: To be awarded annually to a graduate from the Master of Music program of The University of Alberta, based on outstanding merit in studies and strong potential ability for a professional career in music. The award must be used toward further study either with a recognized private teacher or at a recognized institution. The award is to be given as one award and may not be divided.
Donor: Mrs. Flore Shaw of Berwyn, Alberta.
Apply: Selection will be made by the Department of Music.

The J. MacGregor Smith Graduate Scholarship

Field of study: Agricultural Engineering.
Value: $5,000.
Conditions: Offered every year to a graduate student in Agricultural Engineering.
Donor: The estate of Mrs. Ida Baldwin Smith.
Apply: Administrator of Student Awards by February 1.

The Max and Marjorie Ward Scholarship

Field of study: Wildlife Biology of the North.
Value: $500.
Number: 2.
Conditions: Open to graduate and undergraduate students working in the field of wildlife biology of the north; to be used in support of summer research. When conditions warrent the same student in a given year can have both awards, totalling $1,000.
Donor: Endowed by friends of Max and Marjorie Ward.
Apply: Chairman, Department of Zoology by April 1.

The Warner-Lambert Park-Davis Pharmacy Research Fellowship

Field of study: Pharmacy.
Value: $1,600 plus a grant of $400 to the Faculty of Pharmacy.
Conditions: Offered annually for graduate study in the Faculty of Pharmacy. Recipients must be Canadian citizens or Permanent Residents (Landed Immigrants).
Apply: Awarded on recommendation of the Faculty.

The Samuel F. Woloshyn Memorial Summer Award

Value: $1,000 over the four month summer intersession period.
Conditions: To be awarded to a student in the Faculty of Graduate Studies and Research to assist in research related to the study of the cultural, organizational and/or the social life of Ukrainians in Canada. (Under special circumstances the value may be increased in any one year but the total in any three years may not exceed $3,000.)
Donor: The Board of Directors, St. John's Institute, Edmonton, Alberta.
Apply: By letter to the Administrator of Student Awards by March 1, giving some detail of the proposed research project.

The Xerox Canada Inc. Fellowship

Field of study: Business Administration.
Value: $2,000 over 8 months.
Conditions: To be awarded to a student of outstanding merit entering or already in the M.B.A. program at The University of Alberta.
Apply: Administrator of Student Awards by February 1.

Graduate Assistantships

WINTER SESSION: (September 1 to December 31 and January 1 to April 30).
Field of study: Available in most departments.
Value: 4,600 to $6,900 for eight months.
Conditions: Full-time assistantships normally require 12 hours of teaching or service per week. Part-time assistantships may be given in some departments.
Apply: Chairman of Department concerned by March 1.

INTERSESSION: (May 1 to August 31).
Field of study: Available in many departments.
Value: $2,080 (Master) or $2,280 (Ph.D.)
Conditions: Awarded to students already engaged in a program leading to a graduate degree, who are prepared to spend all or part of four months of the summer on a full-time graduate program. Holders of twelve month awards are not eligible. Appointments for fewer than four months may be made. Recipients must have been full-time graduate students at this University during the immediate preceding academic term. Tenure of a full-time assistantship must begin May 1.
Apply: Appointments will be made on recommendation of Department.

Research Grant Assistantships

Field of study: Available in many departments.
Value: Some assistantships from research grants made to departments or staff members may be offered. These are of variable amounts as established by the granting agencies.
Conditions: These normally permit full-time graduate study on the holder's own program.
Apply: Chairman of Department concerned by March 1.

AOSTRA Postdoctoral Fellowships

Field of study: Development of the Oil Sands.

Value: $15,000 first year; $16,500 second year, $18,000 third year.

Number: Variable.

Conditions: To be awarded to outstanding applicants who submit a suitable proposal for a research project to be conducted in a field related to the development of oil sands in Alberta.

These fellowships, which will be granted on merit only, based on the clarity of the proposal, are tenable at the Universities of Alberta, Calgary, or Lethbridge.

There is a moderate research allowance with each followship. A report must be submitted, demonstrating satisfactory progress, at the end of each year.

Prospective applicants for these awards should discuss their intentions with their department chairmen.

Donor: Alberta Oil Sands Technology and Research Authority.

Apply: Administrator of Student Awards by February 15 for awards tenable May 1 or September 1, and September 1 for awards tenable on January 1 of the next year.

Izaak Walton Killam Memorial Postdoctoral Scholarships

Scholarships are available in most fields of study. The value is $17,500 per year plus travel expenses in the amount of return economy air fare for the holder. There is also a $1,200 research grant attached to the award. Appointments are for two years. Departments may offer an additional stipend of up to $4,000 if the Scholar teaches a full formal course as part of his duties. These awards are tenable only at The University of Alberta and students who have achieved their Doctor's degree from this University are not eligible. Tenure must be taken up not later than the following January 1 or (September 1, if a course is being taught).

Application forms may be obtained from the Dean, Faculty of Graduate Studies and Research, and must be returned complete with curriculum vitae, transcripts of academic record and three Letters of Recommendation by January 2.

225 GRADUATE AWARDS MADE BY OTHER AGENCIES

225.1 *Introductory Note*

It is requested that any student receiving one of the awards listed in the following section report the fact to the Administrator of Student Awards as a matter of information.

Graduate awards in Agriculture, Dentistry, Law, Home Economics, Medicine, Nursing, Pharmacy, and Social Work are not listed in § § 225.2 or 225.3 but in a special section § 225.4

225.2 *Awards Tenable at the University of Alberta or Elsewhere*

Refer also to § § 225.3 and 225.4.

The John Walker Barnett Fellowship in Education
The F. J. C. Seymour Fellowship in Education

Valued at $4,200 each these awards are offered to residents of Alberta, who are members, or associate members, of the Alberta Teachers' Association, and who are admitted to the Faculty of Graduate Studies of any recognized university for intramural study at a regular winter session on a doctoral program in education.

Application forms are obtainable from the Scholarship Committee, Alberta Teachers' Association, Barnett House, 11010-142 Street, Edmonton T5N 2R1, and should be returned by February 28.

The Social Sciences and Humanities Research Council Awards

These are provided in the fields of the arts (defined as architecture, the arts of the theatre, literature, music, painting, sculpture, the graphic arts and other similar creative and interpretative activities), the humanities and the social sciences, including education, business administration, law and physical education.

a) *Doctoral Fellowships.* Values of up to $7,860 for students in doctoral programs.

Candidates must have completed one year of graduate study by the date of taking up an award. Applicants must be Canadian citizens or have held Permanent Resident (Landed Immigrant) status for a year prior to application. (For study abroad one must have held such status for one year prior, and fulfill certain other conditions.)

Travel grants may be given in addition where necessary.

Application forms and general regulations will be distributed to departments concerned each year as they are received from the Council by the Administrator of Student Awards. The application date will likely be about November 15.

b) *Special M.A. Scholarships.* All candidates must first be nominated by a faculty member of a Canadian University. These are offered to M.A. Candidates in the Humanities and Social Sciences who, at the time of application, are in the final year of an Honors B.A. program, or its equivalent, at a Canadian University, or hold a B.A. Honors degree, or its equivalent, from a Canadian University. The nominee must have first class standing in the present or previous course of studies and have the intention of pursuing full-time graduate studies at a Canadian University with a view to obtaining a Master's degree. Nominees must be Canadian citizens at the time of application. The scholarships are valued at $7,860 for 12 months and are not renewable. Information regarding the nomination and application procedure is distributed to the departments concerned each year. The nomination date will likely be November 15, and the application date December 15.

The Gulf Oil Canada Limited Graduate Fellowships

Nine fellowships of $7,500 to the student plus $1,000 to the department of the university, will be offered annually and are open to residents of Canada (citizens or Permanent Residents (Landed Immigrants) with one year's residence at the date of application) who are graduates of a Canadian university, for graduate study in Engineering, Geology, Geophysics, Chemistry, Physics, Mathematics, Business Administration or ecologically oriented studies at a Canadian university.

Application forms may be obtained from Director of Awards, Association of Universities and Colleges of Canada, 151 Slater Street, Ottawa K1P 5N1, and must be filed complete by February 1.

Imperial Oil Graduate Research Fellowships

Imperial Oil Limited offers annually six research fellowships of $5,000 per year in Canadian funds for a period up to three academic years. Three fellowships are offered in the fields of Pure and Applied Science including Mathematics and three are offered in the Social Sciences and Humanities. These are open to Canadian citizens who are graduates of any approved university and may be tenable at any university, approved by the donor, for graduate studies leading to a doctor's degree.

Universities wishing to sponsor one or more students should address their applications to the Coordinator, Contributions Higher Education, Imperial Oil Limited, 111 St. Clair Avenue West, Toronto, Ontario, M5W 1K3, by February 1.

Any student who wishes to be sponsored for this award should apply to the Administrator of Student Awards not later than January 20.

The Natural Sciences and Engineering Research Council Awards

The Natural Sciences and Engineering Research Council offers annually postgraduate awards to students of outstanding ability in Agriculture, Biology, Genetics, Chemistry, Physics, Geology, Physical Geography, Mathematics, Engineering and Experimental Psychology.

(1) Scholarships of $8,500 over twelve months tenable in Canada (tenure abroad, only in special cases).

(2) 1967 Science Scholarships of $11,200 per year for three years, Fifty only on a university nominated basis.

(3) Postgraduate Scholarships in Science Librarianship and Documentation

These scholarships are open to persons with a bachelor's degree in science or engineering, who are interested in a career as a science librarian, documentalist or science information specialist. The object of the program is to enable such persons to undertake a year of specialized training in a recognized School of Library Science and Documentation. A limited number are available annually.

(4) Postgraduate Scholarships in Meteorology and Atmospheric Sciences.

On behalf of the Atmospheric Environment Service, Environment Canada, the Natural Sciences and Engineering Research Council offers annually a limited number of these awards. They are in all respects the same as the Natural Sciences and Engineering Research Council Postgraduate Scholarships described in this announcement. The object of the program is to encourage original research in the atmospheric sciences and to help to maintain the supply of Canadian scientists in the field.

Application forms and general regulations may be secured from the Administrator of Student Awards, The University of Alberta. These will be distributed to Departments concerned each year as they are received from the Council. The application date will likely be about December 1.

The Doctor Jean C. Nelson Memorial Award

Description of the Award

The purpose of the Doctor Jean C. Nelson Memorial Award is to assist the recipient to pursue graduate study related to community health. To honor Dr. Nelson's commitment to the health of children, the Awards is particularly intended to provide opportunity to study in fields related to services for children. Although the annual award is tenable at any recognized university, its intent is to further the quality of community health services in Alberta.

Amount

The monies awarded will be at least $3,000.

Qualifications of Recipients

a. Must hold an undergraduate degree from a recognized university or college.
b. Must currently be enrolled in, or have applied for, the proposed graduate program and been accepted prior to receipt of the award monies.
c. Must have satisfactory references.
d. Preference will be given to persons who:
   i) are Albertans and / or are planning to serve in a health-related position in Alberta;
   ii) have had experience in the field of community health and / or paediatrics;
   iii) are, or have been members of the Alberta Public Health Association or the Canadian Public Health Association.

Application forms are available from:

The Doctor Jean C. Nelson Memorial Foundation
c / o The City of Edmonton Health Department
7th Floor, C.N. Tower
10004-104 Avenue
Edmonton, Alberta
T5J 0K1

The J. H. Stewart Reid Memorial Fellowship

$4,500 is offered annually in any field of graduate study by the Canadian Association of University Teachers. Applicants must be Canadian citizens or have held Permanent Resident (Landed Immigrant) status for one year prior to application.

Apply to the above Association, 66 Lisgar Street, Ottawa, Ontario K2P 1C1, by February 1.

225.3 Awards Tenable Only at Other Institutions

The Commonwealth Scholarships

This is a joint plan to exchange approximately one thousand postgraduate students within the Commonwealth. Each Commonwealth country accepts and provides for a certain number of students from other Commonwealth countries. Scholarships are normally for a period of two years and cover all expenses and travel. Recipients need not be working towards a degree in the other country, but may be doing a year or more of research towards a degree from their home University.

Application dates vary for different countries, especially those in the Southern Hemisphere. Application date for those tenable in the United Kingdom will be October 31 of the year preceding the one in which the award is tenable.

Apply for information to Administrator of Student Awards.

The 1851 Exhibition Science Research Scholarships

These are to the value of £2,500 per annum for two, or in rare instances, three years, together with certain possible allowances for fees and travelling expenses. The object of the scholarship is "to enable selected students of overseas universities who have already completed a full university course to devote themselves for two years to research work in pure or applied physical or biological sciences".

A candidate must be (a) a citizen of any country in the British Commonwealth (b) less than 26 years of age. The candidate must have been a student of science in a university or university institution for a period of not less than three years, and must have spent one full academic year ending not more than twelve months prior to the date of recommendation at the institution by which he is recommended.

The scholarship is tenable in the United Kingdom or abroad, but not normally in a country in which the student has already studied.

Students intending to apply for this scholarship should communicate with the Administrator of Student Awards before February 15 so that applications may be in London by March 21.

Edmonton Churchill Scholarship

The Rt. Hon. Sir Winston Churchill Society of Edmonton, Canada, offers a scholarship in the amount of $8,000 tenable at Churchill College, Cambridge, to a graduate of the University of Alberta to enable the student to carry on advanced study in the field of energy. The award will normally be made to a student immediately on completion of a Bachelor's or Master's degree, although candidates who have spent one or more years in industry following graduation may also be considered.

Funds for the award have been made available through the Churchill Foundation from contributions made by members of the Churchill Society and Friends and by the Government of Alberta.

Applications by letter, should be made to the Dean, Faculty of Engineering, The University of Alberta, Edmonton, by February 1 each year.

The I.O.D.E. Postgraduate Scholarships

The Imperial Order Daughters of the Empire offers a number of scholarships for graduate study in any university in the British Commonwealth. Values are $5,500

in Canada and $6,500 for overseas study. Holders may apply for renewal for a second year at a reduced value.

Fields of study are any subjects vital to the interest of the Commonwealth.

Applicants must be Canadian citizens and have passed their twentieth, but not their thirtieth birthday on December 31 of the year of tenure. They must hold a degree from a Canadian university and must have done or be doing postgraduate work. Candidates must apply in the province in which the university is situated from which he or she has graduated, irrespective of place of residence.

Apply to the I.O.D.E. Scholarship Secretary, Mrs. E. J. Taylor, Box 393, Ponoka, Alberta, T0C 2H0, by December 15.

The Mackenzie King Travelling Scholarships

Several scholarships of $5,000 each will be offered to graduates of Canadian universities for postgraduate study in the United States or the United Kingdom in the field of International or Industrial Relations (including Law, History, Politics or Economics).

Personal qualities and aptitudes will be considered as well as academic standing.

Apply to The Awards Office, Rm 50, General Services Administration Building, University of British Columbia, Vancouver, Canada, V6T 1W5 by February 15.

The Rhodes Scholarship

This scholarship is valued at £2,760 per annum plus tuition and other set fees and is tenable at the University of Oxford for two years (with possible renewal for a third year).

Applicants must be unmarried Canadian citizens or British subjects with at least five years residence in Canada and must have passed their nineteenth, but not their twenty-fifth birthday on October 1 of the year of tenure. They must have completed at least two years at a Canadian university by the date of tenure. Application may be made either in the province of residence or in the province in which the university being attended is situated.

Qualities of character and interest in athletics will be considered as well as academic standing.

The date of application is October 25. Further particulars may be secured from the Student Awards Office or from Dr. T. S. Veeman, c/o Department of Economics, The University of Alberta, Edmonton, Alberta.

Rotary Foundation Fellowships

These are provided by Rotary International for graduate study in a country other than the student's home country. Applicants may be married or single and must be over 20 but not over 28 years of age. Preference will be given to studies in the humanities, languages or social sciences but other fields will be considered.

The fellowship is for one academic year and covers return travel, tuition fees, books, living and incidental expenses. Rotary District No. 536, comprising Alberta and adjacent parts of Saskatchewan and British Columbia selects such a candidate every other year.

Application with supporting documents should be made by March 15 of any even numbered year for the fellowship to begin in the next following odd-numbered year. Applications should be filed with the nearest Rotary Club. For further information contact the nearest Club within the above mentioned District.

225.4 Graduate Awards In Special Fields

225.4.1 AGRICULTURE

Canadian Wheat Board Fellowships

Value: $6,000 each in the first year; $8,000 each in the second year; $10,000 each in the third year.
Number: 2 in each year.

The Canadian Wheatboard has undertaken to provide two fellowships for students in the Ph.D. program which are tenable at the University of Alberta. One of these will be awarded to a student involved in full-time study or research in cereal breeding, the other will be tenable by a student involved in a grain-related research program. Each fellowship awarded will normally be available over a three-year period, given satisfactory academic and research progress by the recipient. The fellowships will be awarded on the basis of the qualification of the graduate students and the merit of the research projects proposed.

Apply to the Dean, Faculty of Agriculture and Forestry by February 1.

225.4.2 DENTISTRY

The Medical Research Council of Canada Awards

Studentships of $6,750 are available from the Council for highly qualified holders of a B.Sc. to do Master's or Ph.D. work in a basic science in a department of a Faculty of Medicine, Pharmacy or Dentistry.

Holders of a professional degree, or of a Ph.D. degree in a basic science, may apply under the Council's fellowship program for further training or research.

Further information may be obtained from the Dean's office. All applications are to be forwarded to the Secretary, Medical Research Council, Montreal Road, Ottawa K1A 0R6.

225.4.3 HOME ECONOMICS

The Ruth Binnie Scholarship

Value: To be announced.
Number: 1.
Conditions: To be awarded to a graduate in the field of Home Economics from a Canadian University, who is a resident of Canada, and who is planning to undertake or who is at present engaged in graduate study at the Master's level in a Home Economics area (e.g. Family Studies, Consumer Education, etc.), at an accredited institution. Special consideration will be given to a student with a high commitment to the profession and to teaching; applicants agree to teach Junior or Senior High School for at least two years after obtaining Master's degree. Selection will be based on academic standing, personal qualities, and potential in the education field and financial need.
Donor: Established at the behest of the late Miss Ruth Binnie of Halifax to promote and encourage the quality of Home Economics education in Canada.
Apply: E. Margaret Pope, Chairman Awards Selection Committee, Canadian Home Economics Association, 151 Slater Street, Suite 203 Ottawa, Ontario K1P 5H3. Application deadline is March 31.

The Carnation Company Incentive Award

Value: $500.
Number: 1.
Conditions: To be awarded to a graduate in Home

Economics (or in a closely allied discipline) from a Canadian university who is planning to undertake graduate study proceeding to a higher academic degree. Special consideration will be given to a student undertaking post graduate study in foods or in food science. The award will be made on the basis of academic standing, personal qualities, financial need and an intended career in the food industry.

Donor: The Carnation Company.

Apply: E. Margaret Pope, Chairman, Awards Selection Committee, Canadian Home Economics Association, 151 Slater Street, Suite 203, Ottawa, Ontario K1P 5H3. Application deadline is March 31.

The Mary A. Clarke Memorial Scholarship

Value: $2,000.

Number: 1.

Conditions: To be awarded to a graduate in Home Economics from a Canadian University who is a resident of Canada and who is planning to undertake, or who is at present engaged in, graduate study proceeding to a higher academic degree. The award will be based on scholarship, personal qualities, past and/or potential contribution to the profession of Home Economics, and financial need.

Donor: Established by the C.H.E.A. Scholarship Fund as a tribute to Mary Clarke, a valued member of the Canadian Home Economics Association and its President from 1952-54.

Apply: E. Margaret Pope, Chairman Awards Selection Committee, Canadian Home Economics Association, 151 Slater Street, Suite 203, Ottawa, Ontario K1P 5H3. Application deadline is March 31.

The Silver Jubilee Scholarship

Value: $2,000.

Number: 1.

Conditions: To be awarded to a graduate in Home Economics from a Canadian University who is a resident of Canada and who is planning to undertake, or who is at present engaged in, graduate study proceeding to a higher academic degree. The award will be based on scholarship, personal qualities, past and/or potential contribution to the profession of Home Economics, and financial need.

Donor: Established by the C.H.E.A. Scholarship Fund to commemorate the twenty-fifth anniversary of the founding of the Canadian Home Economics Association.

Apply: E. Margaret Pope, Chairman, Awards Selection Committee, Canadian Home Economics Association, 151 Slater Street, Suite 203, Ottawa, Ontario K1P 5H3. Application deadline is March 31.

225.4.4 INTERDISCIPLINARY STUDIES

The Canadian Institute of Ukrainian Studies Master's and Doctoral Thesis Fellowships

Field of study: Ukrainians or Ukrainians in Canada in Education, History, the Humanities, Law, the Library Sciences, and the Social Sciences.

Value: Master's $3,600, non-renewable; Doctoral $5,000, renewable.

Number: 5 Masters'; 3 Doctoral.

Conditions: The awards are intended to aid students to complete theses on Ukrainian or Ukrainian-Canadian topics in the above disciplines. Fellowships will be awarded only in the thesis year of an academic program and only for thesis work. Candidates must be Canadian citizens or Permanent Residents (Landed Immigrants) at the time of application. Only in exceptional circumstances may an award be held concurrently with other awards.

Where tenable: Any institution of higher learning in Canada or elsewhere.

Application deadline: January 31 for the following academic year.

Apply: The Canadian Institute of Ukrainian Studies, 352 Athabasca Hall, The University of Alberta, Edmonton, Alberta, T6G 2E8.

225.4.5 LAW

The Viscount Bennett Fellowship

Under the terms of a deed of gift to the Canadian Bar Association from the Right Honourable Viscount Bennett, P.C., K.C., LL.D., D.C.L., the Viscount Bennett Trust Fund has been established to encourage a high standard of legal education, training, and ethics. The annual income from this fund is administered by the Canadian Bar Association.

An award to a maximum of $12,000 may be paid annually to a student for graduate study at an institution of higher learning approved by the Viscount Bennett Fellowship Committee on the condition that the award be the only fellowship, scholarship or grant accepted by the winner for the graduate period.

The fellowship is open to persons of either sex who are Canadian citizens and who have graduated from an approved law school in Canada or who at the time of application are pursuing final year studies as undergraduate students at an approved law school.

Applications shall be in writing to the Communications Director of the Canadian Bar Association and received not later than December 15th of the year previous to that in which the award is to be made.

For application information write the Director of Communications, Canadian Bar Association, 1700-130 Albert Street, Ottawa, Ontario K1P 5G4.

The Viscount Bennett (Law Society of Alberta) Graduate Scholarship

$2,500 is made available from a Trust founded by the late Viscount Bennett. It is offered to graduates of the Faculty of Law, The University of Alberta, for postgraduate study in Law at The University of Alberta or at another recognized institution. Applicants should state an intent to return to Alberta following such study.

Apply to the Dean, Faculty of Law, by February 1.

The Duff-Rinfret Scholarship Programme

This programme offered by the Ministry of Justice in honor of Chief Justice Duff and Chief Justice Rinfret provides for a scholarship to enable a graduate from a Canadian law school to undertake graduate studies in Canada. The scholarship is worth $4,500 plus tuition fees and travelling expenses and lasts for twelve months, but short renewal may be possible in some cases.

Apply to the Dean, Faculty of Law, for details.

225.4.6 LIBRARY SCIENCE

The Canadian Library Association Dafoe Scholarship

Value: $1,750.

Number: 1.

Conditions: To be awarded on the basis of academic standing and financial need to a Canadian citizen or Permanent Resident (Landed Immigrant) who is enrolled in an accredited Canadian library school.

Apply: Scholarships and Awards Committee, Canadian Library Association, 151 Sparks Street, Ottawa, Ontario K1P 5E3.

Howard V. Phalin-World Book Graduate Scholarship in Library Science

Value: Maximum $2,500.
Number: 1.
Conditions: The award must be used for a program of study or series of courses either leading to a further library degree or related to library work in which the candidate is currently engaged or to library work which will be undertaken on completion of the program or courses. The award is restricted to Canadian citizens or Permanent Residents (Landed Immigrants).
Where tenable: At any accredited library school in either Canada or the United States.
Apply: Scholarships and Awards Committee, Canadian Library Association, 151 Sparks Street, Ottawa, Ontario, K1P 5E3.

H. W. Wilson Foundation Scholarship

Value: $2,000.
Number: 1.
Conditions: To be awarded on the basis of academic standing and financial need to a Canadian citizen or Permanent Resident (Landed Immigrant) who is enrolled in an accredited Canadian library school.
Apply: Scholarships and Awards Committee, Canadian Library Association, 151 Sparks Street, Ottawa, Ontario K1P 5E3.

225.4.7 MEDICINE

Medical Research Council of Canada Awards

(See under § 225.4.2. Dentistry above).

The Percy Hermant Fellowships in Ophthalmology

Two awards of $1,500 each will be offered annually by Imperial Optical Company to medical graduates of a Canadian university for further study in Ophthalmology at The University of Alberta, or at another approved institution. Applicants must indicate an intention to subsequently practice this specialty in Canada.

Apply to Chairman, Department of Ophthalmology, The University of Alberta, Edmonton T6G 2E1, by March 1.

225.4.8 NURSING

Canadian Nurses Foundation

Awards of up to $3,000 for masters and $4,500 for doctoral students may be made to applicants who are members of the Canadian Nurses Association. Application forms may be obtained from the Canadian Nurses Foundation after 1 November and must be submitted to the CNF by 31 March each year. To be considered for funding each applicant must obtain unconditional admission status to a masters or doctoral program and be willing to serve in a nursing position in Canada for one year of each academic year funded.

For further information and/or application forms write to the Canadian Nurses Foundation, 50 The Driveway, Ottawa, Ontario, K2P 1E2.

Canadian Heart Foundation Nursing Research Fellowship

Value: $6,750.
Conditions: Awarded on a competitive basis for support of qualified nurses undertaking training in some area of cardiovascular research leading to the attainment of a Master's or Ph.D. degree in any recognized university.
Apply: Canadian Heart Foundation, 1200 - 1 Nicholas Street, Ottawa, Ontario, K1N 7B7. Applications should be submitted on or before October 1 for the following academic year. A second competition is held with a closing date of April 1.

Community Mental Health Bursary

Field of Study: Community Mental Health.
Value: Variable.
Conditions: Applicants must be registered with AARN or PNAA, and currently working in mental health nursing. Candidates are required to submit an essay of approximately 500 words in support of their application.
Donor: Noreen Tusz Memorial Fund.
Apply: The Chairman, Noreen Tusz Fund Selection Committee, 5th Floor, 9942 - 108 Street, Edmonton, Alberta, T5K 2J5, by December 31.

The Abe Miller Memorial Scholarship

Value: $2,000 to be awarded yearly.
Purpose: To assist a member who is enrolled in the final year of a baccalaureate program or in a masters or doctorate program to continue graduate study of not less than one academic year.
Qualifications: Must be a member in good standing of the Alberta Association of Registered Nurses with active practicing membership.
— Must have applied for the proposed course and have been accepted prior to receipt of the award.
— Must have satisfactory performance evaluations and demonstrated leadership ability.
Obligations: The applicant must be returning to employment in Alberta.
— If the applicant for some reason has a breach of the terms, the repayment of funds will be on terms assessed individually by the Selections Committee.
Apply: The Executive Director, AARN, 10256 - 112 Street, Edmonton, T5K 1M6.

Professional Training Grants

Return-in-service financial assistance is available to graduate nurses pursuing postgraduate study in any field of nursing. Application should be made to the Director, Staff Development, Alberta Social Services and Community Health, 9945-108 Street, Edmonton, Alberta.

The Helen M. Sabin Scholarship

Value: $2,000 to be awarded yearly.
Purpose: To assist a member who is enrolled in the final year of a baccalaureate program or in a masters or doctorate program to continue graduate study of not less than one academic year.
Qualifications: Must be a member in good standing of the Alberta Association of Registered Nurses with active practicing membership.
— Must have applied for the proposed course and have been accepted prior to receipt of the award.
— Must have satisfactory performance evaluations and demonstrated leadership ability.
Obligations: The applicant must be returning to employment in Alberta.
— If the applicant for some reason has a breach of the terms, the repayment of funds will be on terms assessed individually by the Selections Committee.
Apply: The Executive Director, AARN, 10256 - 112 Street, Edmonton, T5K 1M6.

The University of Alberta Hospital School of Nursing Alumnae Association Scholarship

Financial assistance is available to graduates of the School to undertake postgraduate work in any field of nursing. Applications should be addressed to the Secretary of the Alumnae Association, c/o Office of Vice-President Nursing, University of Alberta Hospital.

The University of Alberta Hospital Graduate Scholarship in recognition of Fiftieth Anniversary of the School of Nursing

Value: $1,000.
Number: 1.
Conditions: Awarded to a graduate of the University of Alberta Hospital who has been accepted in a University program for advanced study relevant to Nursing, at the Baccalaureate, Masters or Doctoral level.
Where tenable: Any recognized university.
Donor: The University of Alberta Hospital Board.
Apply: Vice-President — Nursing, University of Alberta Hospital, Edmonton, Alberta T6G 2B7.

Victorian Order of Nurses Graduate Bursaries

Value: Up to $9,000.
Conditions: May be awarded to nurses completing preparation in an approved area of study. Those with a particular interest in care of the elderly and chronically ill, research methodology or health administration will be given first consideration. Awards carry an employment committment to the VON.
Apply: The National Director, VON for Canada,5 Blackburn Avenue, Ottawa, Ontario, K1N 8A2.

225.4.9 PHARMACY

The Pfizer Research Scholarship

This scholarship of the value of $300 is offered annually to an outstanding graduate of The University of Alberta who is undertaking graduate work in the Faculty.

Selection will be made by the Faculty.

The Warner-Lambert Park-Davis Pharmacy Research Fellowship

This award of the value of $1,600 is offered annually to a student of outstanding merit undertaking graduate work in Pharmacy at The University of Alberta. A supplementary grant of $400 for equipment and supplies will also be made to the Faculty of Pharmacy. A recipient must be a Canadian citizen or a Permanent Resident (Landed Immigrant).

Selection will be made by the Faculty.

Medical Research Council of Canada Awards

(See under § 225.4.7 Dentistry above).

225.4.10 SOCIAL WORK

The Mary A. Finlay Scholarship in Social Work

$1,000 per year for two years is provided by the Robert Tegler Trust for study in Canada, the United Kingdom or the United States towards a master's or doctor's degree in Social Work or related fields and will normally be awarded every alternate year. The second year will be dependent on satisfactory completion of the first year.

Applicants must be residents of the Province of Alberta and recipients will be required to agree to work in their profession within the Province for at least two years immediately upon completion of their advanced study.

Apply in writing with two letters of recommendation to the Trustees of the Robert Tegler Trust, 602 Tegler Building, Edmonton, by April 15 of the year in which the award is to be made. Inquiry should be made of the donor to determine in which year it will be available.

226 GOVERNMENT FINANCIAL ASSISTANCE TO STUDENTS

226.1 Province of Alberta Assistance— Matriculants And Undergraduates

226.1.1 DEPARTMENT OF ADVANCED EDUCATION

The Province of Alberta provides assistance to students attending university in Alberta.

This assistance is also available for attendance in a course of university level at a college which is affiliated with such a university, or at an approved college or university elsewhere.

Matriculants and undergraduates must be bona fide residents of Alberta.

(1) *Province of Alberta Matriculation Scholarships.* Scholarships of $150 are provided for students entering university the first time who have a matriculation average of 80% or better.

For details, see Matriculation Awards, § 222.1.2.

(2) *Province of Alberta Undergraduate Scholarships.* Scholarships of $150 are provided for undergraduates with an academic standing in the previous year of 80% (grade-point average 7.5) or better.

For details, see Undergraduate Awards, § 222.2.2.

(3) *Loans.* These are available on the basis of financial need only.

(4) *Spring and Summer Session Loans.* Loans on the basis of financial need, are available to undergraduate students enrolled in one or more Spring and / or Summer Session courses for credit towards the degree for which they are registered.

(5) *Assistance to Part-time Students.* Assistance is available to students enrolled part-time in credit courses. Inquiry should be made of the Students Finance Board.

Notes:

1. For all of the above, matriculants and undergraduates who are attending an institution in Alberta may obtain information and application forms from the Student Awards Office of their institution. Information may also be obtained from The Students Finance Board.

2. Students attending outside of the Province of Alberta should apply direct to the Board, Room 1100, Park Square, 10001 Bellamy Hill Road, Edmonton, Alberta, T5J 3B6.

3. Applicants should note that it may take up to six weeks to process applications for assistance for the winter session.

226.1.2 ALBERTA SOCIAL SERVICES AND COMMUNITY HEALTH

Professional Training Grants

A limited number of Professional Training Grants are available for students entering Second Year Dental Hygiene. Grants cover tuition fees, travel expenses and a monthly living allowance. In return for the grants, the recipients must undertake to work in a Health Unit in Alberta for eighteen (18) months. Professional training grants are also available for students in Speech Pathology, Audiology, Social Work, Health Administration, Psychiatry, and Nursing. Application forms are available from the Staff Development Branch, Alberta Social Services and Community Health, 9945 - 108 Street, Edmonton, Alberta.

226.1.3 DEPARTMENT OF EDUCATION, FIELD SERVICES BRANCH

Vocational Teachers Bursary Program

Value: Maximum of $12,000 ($1,200 for each full course).

Number: Variable.

Conditions: Candidates must have possession of an an Alberta Journeyman's certificate or the equivalent. Must also have proof of several years of industrial experience as a journeyman. Applicants must have received notice of acceptance into the Faculty of Education at an Alberta Unversity. Candidates will be interviewed and approved by the Selection Committee of the Alberta Department of Education.

Where tenable: Any Alberta university.

Donor: Province of Alberta.

Apply: Department of Education, Field Services Branch, Devonian Building, 6th Floor, West Tower, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.

226.1.4 DEPARTMENTS OF CULTURE, RECREATION, PARKS AND WILDLIFE

Alberta Library Bursary Program

To provide Alberta residents with an opportunity to enter the profession of librarianship and to ensure the availability of high calibre, professional qualified persons for the province's library system, one award, in the amount of $3,000, is made available annually. The award is restricted to Canadian citizens or Permanent Residents (Landed Immigrants) who have been residents of Alberta for two years. There is a work committment to remain employed in Alberta for two years after completion of studies. Preference will be given to candidates interested in working in public libraries. For application forms, write Alberta Culture, Library Services, 12th Floor, CN Tower, 10004 - 104 Avenue, Edmonton, Alberta, T5J 0K5.

Alberta Library Research Fellowship

To provide an opportunity and encouragement to practising librarians in Alberta for research and study in areas of concern in the public library field or to provide the opportunity to upgrade qualifications through research work, one award, in the amount of $2,000, is made available annually. The award is restricted to Canadian citizens or Permanent Residents (Landed Immigrants) who have been residents of Alberta for two years and are currently employed by a library in Alberta as a professionally qualified librarian. For application forms, write Alberta Culture, Library Services, 12th Floor, CN Tower, 10004 - 104 Avenue, Edmonton, Alberta, T5J 0K5.

Cultural Development Branch. Study grants at various levels of study are available in Drama, Dance, Music, Visual Arts and Crafts, and Performing Arts. There are various application dates. For further information please write: Alberta Culture, 11th Floor C.N. Tower, T5J 0K5, Edmonton, Alberta, ATTN: Cultural Assistance Awards.

4-H. This Branch does not award scholarships from Government funds, but provides information on, and assists in selection of successful applicants for, awards made by others including the Alberta Wheat Board, the Alberta Wheat Pool, the Pennington Memorial Trustee, the Women of Unifarm (Inga Marr Memorial), and the Canadian National Exhibition. The awards are for fur-

ther study in all fields, with emphasis on agriculture-related areas (including Home Economics). Application forms are available from Regional Representatives and/or the 4-H Branch Alberta Agriculture.

226.2 *Province of Alberta Assistance — Graduate Students*

The Province of Alberta provides assistance in various forms to students at a university in Alberta or in a graduate faculty of another approved university.

(1) *Province of Alberta Graduate Fellowships.* A number of fellowships of $7,200 each tenable only in Alberta.

For details, see Graduate Awards, § 224.2.

(2) *Province of Alberta Graduate Scholarships.* A number of scholarships of up to $6,000 each tenable only in Alberta.

For details, see Graduate Awards, § 224.2.

(3) *Loans* are available on the basis of financial need. Applicants must be registered full time in Graduate Studies.

Application should be made early in the session on the Provincial Government form.

Students who are bona fide residents of Alberta who are attending outside of Alberta should apply to the Students Finance Board, Room 1100, Park Square, 10001 Bellamy Hill Road, Edmonton, Alberta T5J 3B6.

226.3 *The Canada Student Loans Plan*

The Canada Student Loans Plan was inaugurated in September 1964. Under this plan full-time students are permitted to borrow, on the basis of financial need.

Applicants must be Canadian citizens, or have Permanent Resident (Landed Immigrant) status and have lived in Canada for at least a year and state an intention to live in Canada after graduation.

Students whose home residence is, or has been, in another province for the past twelve months should apply through the Province.

In the Province of Alberta the same application form covers both the Provincial Students Finance Act and the Canada Student Loans Plan. Assistance may be given under one or other or both plans on the same application form.

226.4 *Federal-Provincial Bilingual Education Program*

Funds may be provided for Alberta students pursuing post-secondary studies in the French language. The eligibility criteria for a bilingual fellowship are as follows: the student is a Canadian citizen or a Permanent Resident (Landed Immigrant); the student is a resident of Alberta; the student has been accepted by a Canadian post-secondary institution providing a milieu conducive to acquiring a better command of his or her second language and is currently enrolled in French language instruction, normally for at least 60% of a full-time program of studies.

The maximum amount of a fellowship is $2,000, which is non-renewable. Preference is given to students registering in Quebec universities, but students of French attending Alberta institutions may be granted smaller awards.

In addition, students who have been awarded the maximum fellowship and who are pursuing their studies in a francophone institution outside the province, may, in subsequent years of their program, qualify for travel bursaries.

The deadline for receipt of applications for the fellowship is September 30th. Applications for the travel bursary may be submitted at any time during the year. Application forms and further information may be obtained from: Students' Finance Board, Room 1100, Park Square, 10001 Bellamy Hill Road, Edmonton, Alberta, T5J 3B6.

226.5 *Northern Alberta Development Bursaries*

The Northern Alberta Development Council Bursary program is intended to offer students who have been long term (3 years) residents of Alberta special bursary assistance where these students demonstrate that they intend to apply their education after graduation in the remote areas of the province. The actual amount of the bursary is dependent upon such factors as the need of the student. Any student who receives a bursary will sign an agreement acknowledging that he/she will work in a remote area of the province for one year of each year of full bursary support.

For further information please contact:

The Secretary
Northern Alberta Bursary Committee
Students Finance Board
1100 Park Square
10001 Bellamy Hill Road
Edmonton, Alberta
T5J 3B6

227 OTHER SOURCES OF FINANCIAL ASSISTANCE

University Student Loan Fund

Generally all University of Alberta students are eligible to borrow from this fund which was set up through the generosity of private donors. Short-term emergency loans may be made to students in financial need. Applicants must be making satisfactory academic progress. Interest at 10% per annum from the date of loan will be charged on loans not paid within six months.

Apply to Administrator of Student Awards, The University of Alberta.

Terwillegar Memorial Fund

This fund was established by Dr. Norman L. Terwillegar in memory of his only sons, Norman Allin, who was killed while serving with the British Navy, and William Robert, who served in the Royal Canadian Air Force and who died while attending Queen's University; both were former students of The University of Alberta.

The proceeds of the fund will be available to suitably qualified students in Medicine or Engineering in the form of loans, free of interest to the date of graduation. Application forms and further information may be obtained from the Deans of Medicine and Engineering.

The Alberta Dental Association Student Loan Fund

The Association has established a loan fund for undergraduate students in the Faculty of Dentistry.

Apply to the Office of the Dean of Dentistry.

The American Dental Trade Association

The Association has made available a sum of $700 annually to be issued as loans to students who have entered or are about to enter, the final year in the Faculty of Dentistry and who require financial assistance. Application should be made to the Dean.

The Albert Strickler Memorial Loan Fund

This fund, which is administered from Philadelphia, provides for loans up to $600 for students in the Faculty of Medicine. While this is not restricted to American citizens, it may be of particular interest to any such who are studying at this University. Apply to the office of the Dean of Medicine.

Medical Class of '41 Loan Fund

A fund has been established by the Medical class of '41 from which small loans may be made at the discretion of the Dean of Medicine. Inquiries should be made at the office of the Dean of Medicine.

Kellogg Foundation Fund Loans

Through the generosity of the Kellogg Foundation of Battle Creek, Michigan, a sum of money has been made available to serve as a revolving fund to provide a limited number of loans to needy students in Medicine or Dentistry. For particulars in regard to these, apply to the Dean of Medicine or Dentistry.

The Maude Abbott Memorial Loan Fund

This fund has been established by the Federation of Medical Women of Canada. Loans up to $350 per year are available to women medical students or first year interns. A loan up to $1,000 may be granted to a medical woman for postgraduate training.

Apply to The Maude Abbott Memorial Fund, c/o The Federation of Medical Women of Canada, 1867 Vista Drive, Ottawa, Ontario.

The George E. McDougall Loan Fund

The fund was established to assist needy students in Engineering. Inquiries should be made to the Administrator of Student Awards.

The Fred Mutzneek Bursary Fund

This small bursary fund was established to aid needy students by a bequest of the late Fred Mutzneek Estate through the Grand Lodge of Alberta, A.F. and A.M.

The Harry F. Bennett Educational Fund

This loan fund has been established by members of the Engineering Institute of Canada in memory of the late Harry F. Bennett, M.E.I.C.

Loans from this fund are available to deserving students in the Faculty of Engineering who have successfully completed their first year and are in need of financial assistance. The maximum loan in any year is $250 and for all years $450.

Application forms and further information concerning this loan fund may be obtained from the Dean of Engineering.

The Joseph Stiles Beggs Bursary Fund

This small bursary fund was established to help needy students by Mr. and Mrs. Joseph Stiles Beggs of California.

The Association of Professional Engineers of Alberta Student Loan Fund

The Association has provided a fund from which loans may be made to students in Engineering, Geology or Geophysics. This fund is designed for emergency loans and generally students should have exhausted the other normal sources first.

Apply to the Dean of Engineering or the Chairman of the Department of Geology or of Physics.

Proctor and Gamble Forestry Student Bursary Fund

This fund was established by forestry staff of Procter and Gamble Cellulose Ltd. It is designed to provide emergency assistance to forestry students and support to forestry student activities at the discretion of the Department of Forest Science.

W. R. Zeidler Memorial Loan Fund

This fund which is administered by the Department of Forestry, was established by the Zeidler Forest Industries Limited in memory of its founder, Mr. W. R. Zeidler. Small interest free loans to Forestry students may be made from this fund.

228 CANADIAN ARMED FORCES SUBSIDIZATION PLANS

228.1 General Information

The high professional ability required of present day military officers demands the best in education and training. The Department of National Defence therefore sponsors programs of university education and leadership training for selected young men and women who have the potential to become officers in the Canadian Armed Forces. The admission standards are high, but for those who qualify the way is open to a challenging and rewarding career.

The programs sponsored are the Regular Officer Training Plan, (ROTP), Medical Officer Training Plan, (MOTP), Dental Officer Training Plan (DOTP) and Reserve Entry Training Plan (RETP). Training given under these plans is divided into two parts: normal attendance at university throughout the academic year and military training each summer.

228.2 Regular Officer Training Plan

This plan combines university subsidization with career training as an officer in the Regular Component of the Canadian Forces. Successful applicants are enrolled in the rank of Officer Cadet. They are required to maintain a good standing both academically and militarily while in the plan. All tuition and other essential fees are paid by the Department of National Defence. In addition the Officer Cadet receives an annual grant to purchase books and instruments, and is paid for personal and living expenses. This increases annually. Free medical and dental care is provided. Annual leave (20 working days) with full pay and allowances may be granted each year, usually after the summer training period.

228.3 Medical Officer Training Plan

The Medical Officer Training Plan provides, at public expense, academic and internship training of not more than three years and nine months of the final medical studies, including compulsory internship, for undergraduates of Canadian medical schools who enrol in the Canadian Forces for service as Medical Officers. It consists of paid tuition, an annual book and instrument grant, complete medical and dental coverage, paid holidays and monthly pay of 2nd Lieutenant. Three years military service in the Canadian Armed Forces starting with the rank of Captain, is required upon obtaining your licence to practice medicine.

228.4 Dental Officer Training Plan

Sponsorship is provided under the Dental Officer Training Plan during the 1st, 2nd, 3rd and 4th year of dentistry. Subsidization consists of paid tuition, an annual book and instrument grant, complete medical and dental coverage, paid holiday and monthly pay for personal and living expenses. Four years military service in the Canadian Armed Forces starting with the rank of Captain is required upon receiving your licence to practice dentistry. Three years obligatory military service applies for successful candidates who are sponsored for three years or less.

228.5 Reserve Entry Training Plan

This plan provides an opportunity for selected undergraduates to prepare themselves for promotion to commissioned rank in the Reserve Component of the Canadian Forces. They are selected during the later months of the University year by the local Reserve Unit and are enrolled as Officer Cadets in the Primary Reserve. Cadets receive pay for training completed at local Reserve Units during the academic year (up to 15 days) and at training bases during the summer (up to 16 weeks).

228.6 Admission Requirements

An Applicant must:

(a) be a Canadian citizen;

(b) be physically fit for enrolment in the force; and

(c) if ROTP, be between the ages of 16 and 21 on the first of January of the year of commencement of first year studies at University; if MOTP and DOTP, be between the ages of 17 and 35; RETP from 17 to 23.

NOTE: The above plans are subject to change without notice. The monthly pay associated with each plan normally increases annually.

228.7 How to Apply

Students interest in ROTP, MOTP or DOTP are requested to contact the following:

Commanding Officer,
Canadian Forces Recruiting Centre
10414 - 103 Street
Edmonton, Alberta T5J 0J1

Students interested in RETP are requested to contact:

Commander
Northern Alberta Militia District
Building H-9
CFB Edmonton (Griesbach)
143 Ave and 108 Street
Edmonton, Alberta T0A 2H0

The Commanding Officer
HMCS Nonsuch
11440-117 Street
Edmonton, Alberta T5G 2W5.

General Information

241 UNIVERSITY HISTORY AND TRADITIONS

241.1 Historical Sketch

241.1 INTRODUCTORY

The University of Alberta is a publicly supported, co-educational institution, sharing with the Universities of Calgary and Lethbridge, and Athabasca University, the sole right of conferring degrees, other than degrees in Divinity, within the Province of Alberta. It is a member of the Association of Commonwealth Universities and of the Association of Universities and Colleges of Canada.
tion of Universities.

The University's main campus of 154 acres borders the wooded southern bank of the North Saskatchewan River and lies about two miles from Edmonton's business centre. The University Farm of approximately 700 acres is the largest property away from the main campus but other holdings include the botanical gardens near Devon and lands as far distant as Fort Assiniboine. A considerable area is held under rental agreements, including the Ellerslie farm and the Kinsella ranch.

Some two dozen major teaching and research buildings are situated on the campus as well as two affiliated colleges, six halls of residence, the Students' Union, and service buildings. Michener Park, once part of the University Farm, is a student housing area. South of 87th Avenue, on lands formerly part of the original campus, are the quarters of the Research Council of Alberta, the Provincial Laboratory of Public Health, two teaching hospitals, the Edmonton Veterans' Hospital, the Aberhart Sanatorium, the Dr. W. W. Cross Cancer Institute, and the Northern Alberta Jubilee Auditorium.

241.1.2 THE BEGINNINGS OF THE UNIVERSITY

Alberta became a province in 1905. In 1906 the first session of her legislature passed an act to authorize the establishment of The University of Alberta. The act's sponsor was Alexander Cameron Rutherford, Alberta's first Premier and first Minister of Education. His government purchased the site in what was then Strathcona, and Dr. Rutherford himself persuaded Henry Marshall Tory to leave McGill to become the University's first President, an office he held from 1908 to 1928.

The Act permitted all resident graduates of British and Canadian universities to register as members of Convocation. Convocation elected five members to a Senate; the government appointed ten more. The Senate, acting as the governing body of the University, established the Faculty of Arts and Science as the core of the new institution. In 1910 a revision of the *University Act* constituted the Board of Governors, with powers of business management and administration.

Classes opened in September, 1908, in what is now Queen Alexandra School with forty-five students and a faculty of five: W. H. Alexander, Classics; E. K. Broadus, English; W. M. Edwards, Mathematics; L. H. Alexander, Modern Languages; and Dr. Tory himself. Thence they moved to the upper floor of Strathcona Collegiate Institute and then in 1911 to Athabasca Hall. Athabasca not only served as residence for staff and students, but also accommodated classrooms, laboratories, the library, the gymnasium, and the administrative offices. The members of the first graduating class received their degrees at the Convocation of 1912, with Mr. Justice C. A. Stuart presiding as Chancellor.

A period of rapid growth followed, with registration reaching 439 in 1914. Assiniboia Hall was completed in 1913, Pembina Hall in 1914, and the Arts Building was formally opened in 1915. The Faculty of Law had its beginning in 1912. In the same year the Department of Extension initiated its work of promoting a closer relationship between the University and the people of the province. In 1913 the Faculty of Applied Science (in 1948 renamed Engineering) and the Faculty of Medicine were instituted, the latter able to offer three years of a five-year program.

The Students' Union was established during the first session and the first edition of *The Gateway*, the students' newspaper, appeared in 1911. The Committee on Student Affairs began in 1912 as a joint committee of students and University officials to exercise general supervision over matters affecting student welfare and discipline. Today the Council on Student Affairs carries on its work.

241.1.3 YEARS OF CHALLENGE: 1914 TO 1945

The outbreak of war in 1914 slowed the pace of development. The new University sent 438 of its staff, alumni, and students to the armed forces. Eighty-two were killed or died on active service. Their names, together with those of the casualties of the war of 1939-45, are commemorated on a bronze tablet near the entrance to Convocation Hall.

Although the war brought a halt to the building activity, the organization of the University's teaching moved on with the establishment of the Faculty of Agriculture in 1915, the School of Accounting (later the Faculty of Commerce) in 1916, the School of Pharmacy and the sub-faculty of Dentistry in 1917, and the Department of Household Economics in 1918.

With the end of the Great War the University rapidly expanded in number of students and staff. New laboratory facilities were built adjacent to the Arts Building, and the Medical Building was completed in 1921 in the form it had until new wings were added following the war of 1939-45. The curriculum was fundamentally revised in 1919-1920 to permit greater freedom in election of courses. The first summer session was held in 1919. The institution of the Research Council of Alberta signified not only an increasing emphasis on science, but a further recognition of the University's involvement in the development of the province. In 1927 St. Joseph's College was opened under Roman Catholic auspices. St. Stephen's College had, as Alberta College South, been the first building on the campus. It was renamed in 1927 after the union of the Methodist and Presbyterian churches and became the United Church theological college for Alberta.

The depression years brought serious problems. Though registration did not decline, its increase was painfully slow, from 1,560 students in 1929 to 2,327 in 1939. Full-time teaching staff increased even more slowly. The budget actually fell and did not recover to its pre-depression level until after the war. No new

building took place after the present Corbett Hall was completed. (Corbett Hall was originally constructed as a provincial normal school, not a University building.) Dr. R. C. Wallace succeeded President Tory in 1928, and in 1936 was followed by Dr. W. A. R. Kerr, who had been the first Dean of the Faculty of Arts and Science. The affiliation of Mount Royal College in 1931 marked a new beginning of university work in Calgary. The Banff School of Fine Arts opened in 1933 and the Western Board of Music was established in 1931. Entrance to the University from Grade XI was abolished in 1937. In 1930 fraternities were permitted; a less controversial change was the abolition of the old practices involved in freshman initiation.

The impact of the war of 1939 was very different from that of 1914-18. Though war naturally disrupted the University's life, there was a determination to preserve its essential being while using its facilities as fully as possible in relation to the national effort. The Air Force took over the three residences and out-of-town students, whose number had not substantially declined, flocked into Garneau boarding houses and made use of a new cafeteria, known to later generations as Hot Caf (which was demolished in 1969 to provide the site for the Central Academic Building). Medicine, Dentistry, and Education offered accelerated courses. Engineering offered special courses to members of the armed services. No more important development took place than the acceptance in 1945 by the University of sole responsibility for the training of Alberta teachers. The school of Education, established in 1928, became a faculty in 1942, and after the war it became, in terms of enrolment, the largest in the University.

Dr. Robert Newton was named President on Dr. Kerr's retirement in 1941. He played an important part in the framing of the University Act of 1942, which transferred from the Senate to the General Faculty Council jurisdiction over academic matters and vested all final authority in the Board of Governors, whose jurisdiction had previously been confined to finance. No major changes in the University's constitution occurred until the Act of 1966 provided for the establishment of other and separate provincial universities under a Universities' Commission, since disbanded.

241.1.4 YEARS OF EXPANSION: 1945 TO 1969

With the end of the war, a flood of veterans poured into the University and registration rose from 2,023 in 1943-44 to a peak of nearly 5,000 in 1947-48. Accommodation in classrooms, laboratories, and libraries was pathetically inadequate, and housing was generally even less satisfactory. Army huts only partially relieved the pressure. While by 1947 student numbers had tripled from pre-war figures, the full time teaching staff did not even double. Thereafter the pace of campus development slowly increased. New wings were added to the Medical Building in 1947 and 1948; the first Students' Union Building opened in 1950, the Rutherford Library and the Engineering Building in 1951, and the Agriculture Building in 1953. The latter was enlarged in 1958 to become the Agriculture and Biological Sciences Building. The Administration Building dates from 1957.

The hectic post-war years merged into the slower growth of the 1950's. Dr. Andrew Stewart became President in 1951 and was succeeded by Dr. Walter H. Johns, who served from 1959 to 1969. In that ten-year period the enrolment rose from approximately 5,000 to 17,500, as the post-war generation came to university age.

This unprecedented increase in numbers made necessary the rapid construction of new buildings during the 1960's. The Physical Education Building, the Physical Sciences Building, and additions to the Medical and Engineering Buildings were followed by the Education Building in 1963, the Donald Ewing Cameron Library, the Household Economics Building, and the new residences named after western explorers. The dining centre was named in honor of Reg Lister, who had for so many years taken care of the older residences. The Henry Marshall Tory Building was opened in 1966, Phase I of the Engineering Centre in 1968, and the Clinical Sciences Building of the Faculty of Medicine in 1969. A new Students' Union Building opened in 1967.

The increasing range and complexity of subjects studied at the University was reflected in the classification of Graduate Studies as a faculty in 1957, in the division of the Faculty of Arts and Science into two faculties in 1963, and in the foundation of a number of new centres and institutes dedicated specifically to research. Outside of Edmonton, the University's work in Calgary, instituted in 1951, gradually expanded and an affiliated junior college was established in Lethbridge. These became separate universities in 1966. Other junior colleges in Medicine Hat, Camrose, Red Deer, and Grande Prairie became affiliated with the University to help bring higher education to more areas of the province.

241.1.5 RECENT YEARS

Dr. Max Wyman, the first graduate of the University to become its president, took office in 1969 and served until 1974; Dr. Harry Gunning, who succeeded him, held office from 1974 to 1979. During these years new problems arose, as a levelling-off of student numbers and world-wide inflation made the University's projected budgets less adequate than had been expected. Buildings already begun were completed one by one: the Biological Sciences Centre and the Central Academic Building in 1970, the Law Centre in 1971, and the Basic Medical Sciences Complex and the Engineering Centre, Phase II, in 1972. In 1972, also, the first residents moved into the Housing Union Building, designed and financed on the initiative of the Students' Union. Since then, the Humanities Centre, the Fine Arts Building, one phase of a projected expansion of the Rutherford Library, and additions to the Chemistry Building and Education Building have successively come into use. In 1978, following several years of moratorium on construction, ground was broken for a new Agriculture and Forestry Building.

A growing awareness of the value, both architectural and practical, of the University's older buildings led to a decision to renovate, rather than demolish, Pembina Hall. Pembina's transformation into a fully modern graduate student residence was so successful that it earned national recognition in the form of a Heritage Canada Award. Athabasca Hall underwent an even more drastic transformation, as its wooden construction needed to be completely replaced with modern materials; the renovated building was reopened in the autumn of 1977 and received a Heritage Canada award in its turn. In the autumn term of 1978 three concerts were held to commemorate the installation of a new organ in the renovated Convocation Hall.

In 1970 the Collège Saint-Jean, in South Edmonton, became an integral part of the University as the Collège Universitaire Saint-Jean and in May of 1978 it became the University's newest faculty when the name officially changed to Faculté Saint-Jean. It offers a bilingual program of courses in Arts, Science, and Education.

Spring Session (a six-week period between the end of the regular Winter Session and the beginning of Summer Session), during which intensive courses are offered, was inaugurated in 1972 and proved an immediate success.

The importance of scholarly publishing in the academic community was recognized when the Board of Governors formally established the University of Alberta Press. Although at first without regular staff, the Press nevertheless succeeded in publishing a small group of works of high quality. The appointment of L. E. S. Gutteridge as the first Director of the Press in 1977 placed its operations on a more adequate basis, and gave promise that the University's contributions to scholarship through publication would increase in future.

Dr. Myer Horowitz was installed as the ninth president of the University in September, 1979.

241.2 University Traditions

241.2.1 THE UNIVERSITY MOTTO

The University motto, *Quaecumque vera*, is taken from the Latin Vulgate version of the Bible, the Epistle of St. Paul to the Philippians, chapter 4, verse 8:

De cetero, fratres, quaecumque sunt vera, quaecumque pudica, quaecumque justa, quaecumque sancta, quaecumque amabilia, quaecumque bonae famae, si qua virtus, si qua laus disiplinae, haec cogitate.

The same passage, from the King James version, is:

Finally, brethren, *whatsoever things are true*, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, think on these things.

241.2.2 THE COAT OF ARMS

On November 15, 1909, a Faculty meeting passed a motion recommending to the Senate the adoption by the University of the Provincial coat-of-arms as its crest with the addition of an open book superimposed upon the cross and bearing the motto "Lux et Lex", and also the words "University of Alberta" attached as may seem fit. The present motto was substituted for that originally proposed in January 1911.

In 1950, the form of the shield and other details were altered to conform more strictly to heraldic principles, and the following official description of the Arms was adopted:

Blazon: Azure in front of a range of Snow Mountains proper, a range of Hills *Vert*, in base of a Wheat Field surmounted by a Prairie, both also proper, on a chief *Argent* a St. George's Cross.

Crest: in front of Sun Rays or an Open Book proper.

Motto: Quaecumque vera.

The Arms are copyrighted and may not be used without permission of the Board of Governors. The name of the University is similarly protected.

241.2.3 THE UNIVERSITY COLORS

The original suggestion for the University Colors came from the late Mrs. W. H. Alexander, who drew her inspiration from the autumn colors of the river valley below the campus. Professor Alexander relayed the suggestion to the Faculty meeting of October 5, 1908, which passed it on to the Senate for approval.

At its first meeting of October 13, 1908, the Senate accepted the "beautiful and at the same time infrequent" combination of green and gold as particularly appropriate to the new University of Alberta — the green representing the "wide stretches of prairie land flanked by deep spruce forests", and symbolic of "hope" and "optimism", the gold representing the "golden harvest fields", and symbolic of the "light of knowledge".

241.2.4 ACADEMIC COSTUME

All gowns are to be of the customary Cambridge shape, i.e., for undergraduates, a gown of black material not falling below the knee with round sleeves cut above the elbow; for bachelors, a gown of black material falling below the knee with full sleeves cut to the elbow and terminating in a point; for masters, doctors of medicine and doctors of dental surgery a gown of black material falling below the knee with black sleeves with semi-circular cut at bottom.

Hoods are to be of the Oxford pattern, and of spruce green material.

The bachelor's hood is to have a border (1½ inches wide), the master's a full lining, of the color distinctive of the faculty. The M.D. and D.D.S. hoods are to be of the master's pattern.

The faculty colors are:

Agriculture and Forestry	Pale Blue
Arts (including LL.D.)	White
Business Administration and Commerce	Silver Grey
Dentistry	Maroon
Education	Royal Blue
Engineering	Light Green
Home Economics	Pink
Law	Scarlet
Library Science	Lemon
Medicine	Crimson
Nursing (B.Sc.)	Crimson and White
Pharmacy and Pharmaceutical Sciences	Cinnamon
Physical Education and Recreation	Royal Blue and Gold
Rehabilitation Medicine	Salmon Pink
Science	Gold-yellow

Doctor's gowns (Ph.D. and Ed.D.) are to conform to the Intercollegiate Code in design. They are to be of black material and the velvet trim is to be Philosophy blue for the Ph.D., and Education light blue for the Ed.D. Doctors of Laws are entitled to wear a full-dress scarlet robe faced with white silk.

Doctor's hoods (Ph.D. and Ed.D.) are to conform to the Intercollegiate Code in shape, size and color. They are to be of black material to match the gown, and the full lining is to be of gold satin with a six-inch green satin chevron. The velvet trim distinguishes the two degrees and matches the velvet trim on the gown. There is to be a narrow green piping where the gold lining joins the black material. Honorary degree hoods (LL.D., D.Litt. and D.Sc.) are of scarlet silk and of the Cambridge form and have a full lining of white silk.

All caps are to be of the ordinary black trencher shape with black tassels, with a black velvet cap with gold cord for LL.D., D.Litt., and D.Sc. full dress.

242.1 Introductory

The main lines of the constitution of The University of Alberta are laid down in *The Universities Act* assented to April 15, 1966.

NOTE: § 242.2—Reserved

242.3 The Universities Co-ordinating Council

242.3.1 GENERAL INFORMATION

The Universities' Co-ordinating Council consists of the following representatives of each university in Alberta: the President, the Vice-President (Academic), two Deans and two other members of the academic staff appointed by the General Faculties Council, and not more than three other members of the academic staff appointed by the Co-ordinating Council itself. The Chairman is elected by the Council, but shall not be elected from the representatives of one university for more than three consecutive years. The Council may appoint a secretary and prescribe his or her powers, functions and duties.

The Council inquires into any matter that in its opinion calls for co-operative action on the part of the General Faculties Councils, and makes recommendations thereon to any General Faculties Council or the Minister of Advanced Education and Manpower; it may give its advice and opinions to the General Faculties Council or to the Minister on any matter. It may make recommendations to the Board of Governors of a University or to the Minister. It may determine minimum standards for the affiliation of colleges or other institutions with the Universities, and may recommend that an affiliation agreement be made, modified, or dissolved. It gives or withholds its approval of standards or policies proposed by a General Faculties Council with regard to the admission of first-year students to any University. It has jurisdiction over the conditions of entrance to certain learned professions and callings.

NOTE:§242.4—Reserved

242.5 The Chancellor

Chancellor of the University
J. FOREST

The Chancellor is titular head of the University, and represents the public interest of the University. Elected for a four-year term of office by the Senate, the Chancellor is chairman of the Senate, an *ex officio* member of the Board of Governors, and confers all degrees and represents the University at ceremonial occasions.

242.6 The President and Vice-Chancellor

President and Vice-Chancellor
M. HOROWITZ, Ed.D., LL.D.

The President, who is also the Vice-Chancellor is *ex officio* a member of the Co-ordinating Council, the Board of Governors, the Senate, and all faculty councils. The incumbent presides at meetings of the General Faculties Council, and at his or her discretion may call, and preside at, joint meetings of academic councils. He makes recommendations to the Board of Governors with respect to all appointments, promotions, and removals of members of the academic staff and is entrusted with the general supervision of the academic work and business affairs of the University.

242.7 The Vice-Presidents

Vice-President (Academic)
R. G. BALDWIN, Ph.D.

Vice-President (Finance and Administration)
L. C. LEITCH, LL.B., M.B.A.

Vice-President (Facilities and Services)
R. E. PHILLIPS, B.Sc., P.Eng.

The Vice-President (Academic) is the senior vice-president. In the absence or incapacity of the President or when the presidency is vacant, he is the acting president. The vice-president is *ex officio* a member of the Co-ordinating Council of the Universities, General Faculties Council and the Senate.

242.8 The Board of Governors

242.8.1 MEMBERS

Chairman
J. L. SCHLOSSER

Statutory Members
J. FOREST, Chancellor of the University
M. HOROWITZ, Ed.D., LL.D., President of the University

Representatives of the Alumni Association
B. ADLER, D.D.S.
A. M. ARBEAU, B.A.,B.Sc., M.Ed.

Representative of the Senate
D. RICHARDSON, Ed.D.

Representatives of the Academic Staff
R. J. CRAWFORD, Ph.D.
S. HUNKA, Ph.D.

Representatives of the Students
M. A. GILLIES
N. ASTLEY
P. FISHER, B.Sc., M.Sc.

Other Appointed Members
E. B. ALLAN, B.Comm., C.A.
J. E. BARRY, B.A.
J. BENTLEY, B.A.
M. R. BERRETTI, Doct.Ing., P.Eng.
G. FRYETT, LL.B.
W. T. PIDRUCHNEY, B.A., LL.B.
R. G. REYNOLDS, B.Sc.
D.M. RITCHIE, B.A.

242.8.2 SECRETARY

B.J. SILZER, B.Sc , B.Ed., M.Ed.

The Board of Governors is a corporation with the name "The Governors of The University of Alberta". It consists of a Chairman appointed by the Lieutenant-Governor in Council, the Chancellor, the President, and sixteen other persons appointed by the Lieutenant-Governor in Council. Of the sixteen, two are members

of the Alumni Association nominated by the Association; one is a member of the Senate, nominated by it from those of its members who are not on the University Staff; two are members of the academic staff nominated by the General Faculties Council; two are students nominated by the Students' Council; one is a student nominated by the Graduate Students' Association, and the remaining eight positions are filled by appointments from the public at large.

The conduct, management, and control of the University and all its property, revenue, business, and affairs are vested in the Board. The Board appoints the deans of all faculties, all members of the teaching staff, the Librarian, the Registrar, and all members of the administrative staff, but no one may be appointed to a senior administrative post or to the academic staff of the University unless first nominated by the President of the University. The Board provides for the maintenance of buildings and the erection of new buildings. It has authority to purchase and acquire such property as it may deem necessary for the purposes of the University. It fixes the various fees charged in connection with university courses and it makes financial provision for the establishment of new faculties, departments, and courses. It may establish arrangements designed to contribute to the educational and cultural advancement of the people of Alberta at large. When any question arises as to the powers or duties of the Senate or any other University body or of the President or a Dean or other officer or employee, and these powers and duties are not definitely provided for in *The Universities Act*, the Board's decision on the question is final.

242.9 The Senate

242.9.1 EX-OFFICIO MEMBERS

Chancellor of the University
J. FOREST

President of the University
M. HOROWITZ

Vice-President (Academic)
R. G. BALDWIN

Dean of Students
B. M. SMITH

Dean, Faculty of Extension
C. M. LOCKWOOD

President of the Alumni Association
W. D. USHER

Vice-President of the Alumni Association
J. E. MUCHA

242.9.2 APPOINTED MEMBERS

Appointed by Deans' Council
D. BADIR
G. S. H. LOCK

Appointed by the Board of Governors
J. BENTLEY
W. T. PIDRUCHNEY

Appointed by General Faculties Council
J. A. CREORE
G. PRIDEAUX
P. A. SCHOULS

Appointed by the Alumni Association
H. CHOMIK
F. KOZAR

Appointed by the Minister of Advanced Education
G. C. CAMPBELL
L. CAMPBELL
H. DANIAL
R. EVEREST
E. J. FINCH
T. HABERMAN
J. E. McLEAN
W. F. M. NEWSON
K. C. WEIHER

Appointed by Students' Council
K. FARKAS
T. FRANK
N. INGRAM
D. ROBERTS

Appointed by the Graduate Students' Association
V. THAKUR

Non-Academic Staff appointed by the Minister of Advanced Education
J. M. BRENNAND
J. B. KURIE

242.9.3 ELECTED MEMBERS

R.C. BASKEN
B. BROMLEY
G. BROOKS
A. BURROWS
P. CZARTORYSKI
E. EWASIUK
E. L. FRIED
P. GARIEPY
H. C. HULLEMAN
J. R. KILLEEN
B. KORNBERGER
T. LEADBEATER
M. LOBAY
D. R. B. McARTHUR
S. G. McCURDY
J. R. McDOUGALL
H. W. MEECH
T. MILLER
M. PASULA
D. A. RICHARDSON
Y. ROSLAK
T. SCAMBLER
F. SISSONS
S. SPRAGUE
W. H. STEWART
J. B. STRAIN
M. TRUSSLER
H. VERDIN
T. WILDCAT

242.9.4 EXECUTIVE OFFICER

R. M. TOTMAN, B.A.

The Chancellor of the University is Chairman of the Senate, which has 62 members: 30 of whom are elected from the general public and 9 appointed from the public by the Minister of Advanced Education.

It is the mandate of the Senate to inquire into any matter that might tend to enhance the usefulness of the University. It is specifically authorized to interpret the University to the public, to require reports from faculty councils, the Students' Council, and any members of the academic staff; to receive and consider submissions from anyone interested in the University; to arrange for public meetings, radio and television programs and other means of providing and acquiring information on the University; as a consequence, to make

reports and recommendations to the Board or the General Faculties Council or other appropriate body. In addition, the Senate may authorize the conferring of Honorary Degrees.

The Senate brings together the University and the public. Although it has little formal decision-making power, it seeks to stimulate issues of concern and to aid in their resolution. It is a two-way link between the communities.

242.10 The General Faculties Council

242.10.1 EX-OFFICIO MEMBERS

President
Vice-Presidents
The Deans of the Faculties
The Librarian
The Registrar

242.10.2 ELECTED MEMBERS

50 members elected by and from the faculty

242.10.3 STATUTORY STUDENT MEMBERS

2 Undergraduate students
1 Graduate student

242.10.4 APPOINTED MEMBERS

3 Members of the non-academic staff
3 Librarians
2 Representatives of the academic staff on the Board of Governors and one student representative on the Board of Governors
2 Administrative and Professional Officers
The President of the AASUA
Appointed Graduate Student Members
Appointed Undergraduate Student Members
The Director of Special Sessions
The Principal of St. Joseph's College
Dean of Interdisciplinary Studies
Dean of Students
1 Faculty member from Interdisciplinary Studies.

242.10.5 SECRETARY

E. A. SOLOMON, B.A., M.A.

The General Faculties Council consists of the President, the Vice-Presidents, the Deans, the Librarian, the Registrar, elected members representing the Faculties and appointed members. The number of elected staff members is twice that of the *ex officio* and the number of appointed student members equals the number of elected staff members. The General Faculties Council, subject to the authority of the Board of Governors, is the senior academic body of the University. It approves courses, provides for the granting and conferring of degrees, and hears appeals by students and others from decisions of faculty councils. It makes rules and regulations for the management and conduct of the Library and determines standards and policies respecting admission of students. It may make recommendations to the Board on affiliation of other institutions, on academic planning, campus planning, the budget, procedures regarding appointments, promotions, salaries, tenure and dismissals, and any other matter which it considers to be of interest to the University. It has the general supervision of student affairs.

242.11 The Deans Council

Secretary
M. M. McCAUGHAN, B.A., LL.B., LL.M.,
Executive Assistant to the President

The Deans' Council, consisting of the President, the Vice-Presidents, the Deans, the Registrar and the Librarian, has advisory functions.

242.12 Faculty Councils

Each faculty, except that of Graduate Studies and Research, has a council consisting of the President, the Dean of the faculty, all full-time members of the academic staff of the faculty, a representative of each of the appropriate professional societies associated with the faculty appointed by the General Faculties Council on the recommendation of the society, and other persons appointed by the General Faculties Council on the recommendation of the faculty council. The Council of the Faculty of Graduate Studies and Research consists of the President, the Dean and other persons appointed by the General Faculties Council.

Each faculty council, subject to the control of the General Faculties Council, arranges the courses of study falling within its jurisdiction and provides for the setting of examinations and for determining the results. It deals with admissions and withdrawals, and authorizes the granting of degrees in branches of learning within its jurisdiction.

242.13 Other Administrative Officers

242.13.1 OFFICE OF ADMINISTRATIVE SYSTEMS

P. A. WATTS, B.A., Director
W. E. AFFOLDER, Systems Manager — Financial
B. W. ENGLISH, Systems Manager — Support Services
W. KAZEMIR, Project Manager
J. E. McKEE, Operations Manager
J. A. OGLE, Manager, Research and Planning
R. I. SIMPSON, Systems Manager — Academic
Project Director — C.A.R.S.

242.13.2 ALUMNI ASSOCIATION

A. G. MARKLE, M.Ed., Director

242.13.3 CAMPUS SECURITY

W. F. G. PERRY, Director
C. M. GOODE, Associate Director
R. J. OLIVER, Senior Security Officer

242.13.4 OFFICE OF THE COMPTROLLER

A. S. KNOWLER, B.Com., Comptroller
R. J. LEONARD, C.G.A., M.B.A., Associate Comptroller
M. A. ROUSELL, B.Com., C.A., Consultant to Comptroller
R. N. SPILSTED, B.A., M.B.A., Budget Officer
P. BANKS, B.A., R.I.A., Assistant Comptroller
A. W. McDOWALL, B.A., C.G.A., Administrative Accountant
C. S. JOHNSON, R.I.A., Accountant
L. HOWELL, C.A., Accountant
E. GROVER, B.Sc., B.A., M.B.A., Acccountant

E. FASZER, Payroll and Benefits Officer
R. J. FALCONER, Pensions Officer
C. MacDONALD, B.Com., Staff Accountant
D. COX, Office Manager
M. F. LOFTUS, Analyst, Budget

242.13.5 COMPUTING SERVICES

D. H. BENT, Ph.D., Director
H. F. EWASECHKO, Operations Manager
D. J. FEDORICK, B.A.Sc., Academic Systems Manager
O. V. KOLAR, M.Sc., Administrative and Information Services Manager
C. D. WEBSTER, B.Sc., Equipment and Operating Systems Manager
Y. N. ZIA, M.A.Sc., Academic Applications Manager

242.13.6 DESIGN AND CONSTRUCTION OFFICE

T. C. MINER, M.R.A.I.C., Director
G. T. BALLASH, B.Sc., Project Engineer
B. O. DICK, P.Eng., Project Officer
B. F. PRATT, M.R.A.I.C., Project Officer
M. J. SZYLING, P.Eng., Project Officer

242.13.7 HOUSING AND FOOD SERVICES

G. BROWN, M.P.A., Director
D. AYOTTE, B.A., Food Services Officer
T. DOHM, B.A., Personnel Officer
J. FALKENBERG, Financial Services Officer
R. FRASER, Manager, HUB
J. KERR, Manager, C.A.B. Cafeteria
A. KING, Manager, Lister Cafeteria
R. RAMSHAW, Building Services Co-ordinator
F. WORSFOLD, M.Sc., B.Th., B.A., Housing Manager
T. ROBERTS, Conferences / Customer Services Officer
M. SHAW, B.Sc., Manager, S.U.B. Cafeteria

242.13.8 INSTITUTIONAL RESEARCH AND PLANNING

E. A. HOLDAWAY, Ph.D., Director
P. R. DAVIDSON, M.Sc., Assistant Director
W. D. CAIRNS, M.Sc., Senior Academic Analyst
G. A. FESTER, B.Com., Academic Analyst
N. MEHRA, Ed.D., Academic Analyst
D. J. OTTO, Ph.D., Academic Analyst
B. R. PINCHBECK, Ph.D., Academic Analyst

242.13.9 INTERNAL AUDIT DEPARTMENT

W. R. MAILO, B.Com., C.A., Director

242.13.10 INVESTMENT OFFICE

T.B.A.

242.13.11 OFFICE OF COMMUNITY RELATIONS

W. A. PRESHING, Ph.D., Director
T. PAPIRNIK, Administrative Officer
C. J. SIMPSON, Ph.D., Editor, Folio

242.13.12 PERSONNEL SERVICES AND STAFF RELATIONS

D. A. BRUCH, B.A., Personnel Officer
J. B. CAUNT, M.B.A., Director
L. W. DAVIDSON, B.Com., Staffing and Development Coordinator
A. R. DAVIS, B.A., Wage and Salary Coordinator
S. A. DEAN, Employee Relations Coordinator
W. G. KINSEY, B.A., B.S.W., Occupational Health and Safety Coordinator
J. E. MASON, Personnel Officer
G. M. ORESCAN, B.Com., Personnel Officer
M. J. POCOCK, Personnel Officer
R. H. YAMASHITA, B.A., Personnel Systems Coordinator

242.13.13 DEPARTMENT OF PHYSICAL PLANT

G. A. BULAT, B.Sc., Director
C. W. READE, B.Sc., Plant Maintenance Engineer
S. OSTAPOWICH, B.Sc., M.Eng., Plant Utilities Engineer
R. J. BURNS, B.Sc. P.Eng. Director of Energy Management.
K. MOODIE, B.A.Sc., P.Eng., Engineering Officer
C. H. J. ELLIOTT, Ph.D., P.Eng. Systems Applications Manager
E. EVASON, C.E.T, Technical Applications Manager
P. KUDRYK, Operations Manager
G. JUTTE, Grounds Maintenance Manager
W. S. LARSEN, Building Services Manager
D. McCRANK, Mechanical Utilities Manager
R. MOTYKA, Building Maintenance Manager
K. NIXON, Heating Plant Manager
G. PANTER, Vehicle Pool Manager
D. PRETZLAFF, Projects Manager
C. CARTER, Electrical Utilities Manager

242.13.14 OFFICE OF THE PRESIDENT

M. M. McCAUGHAN, B.A., LL.B., LL.M., Executive Assistant to the President

242.13.15 OFFICE OF THE VICE-PRESIDENT (ACADEMIC)

R. D. BERCOV, Ph.D., Associate Vice-President (Academic)
A. E. ZELMER, Ph.D., Associate Vice-President (Academic)
B. H. McDONALD, M.B.A., Associate Vice-President (Academic Administration)
F. WATTERS, Executive Assistant to the Vice-President (Academic)

242.13.16 OFFICE OF THE VICE-PRESIDENT (FINANCE AND ADMINISTRATION)

W. F. ALLEN, Ph.D. Associate Vice-President (Finance and Administration)
D. C. NORWOOD, B.A. (Hons.), M.A., Executive Assistant to the Vice-President (Finance and Administration)

242.13.17 OFFICE OF THE VICE-PRESIDENT (FACILITIES AND SERVICES)

A. M. RENNIE, Associate Vice-President (Facilities and Services)
P. S. TAITT, Ph.D., Executive Assistant to the Vice-President (Facilities and Services)

Facilities Planning

W. J. WILLIAMSON, P.Eng., M.Sc., Director
W. A. HANSEN, B.Sc., B.Ed., Space Allocations Officer

Utilities Planning and Construction

A. J. ROBERTSON, P.Eng., B.Sc., Director
J. W. HOMER, Project Manager

242.13.18 PRINTING SERVICES

J. R. T. GRANT, Director
L. C. YOUNG, Associate Director

242.13.19 PURCHASING

R. A. BENNETT, B.Com., Director of Purchasing

242.13.20 RADIO AND TELEVISION

W. H. JOPLING, B.Sc. (Civil Eng.), Director

242.13.21 OFFICE OF THE REGISTRAR

W. A. BLANCHARD, Ph.D., Registrar
W. A. D. BURNS, B.A., Assistant Registrar
J. M. DANIEL, B.Sc., B.P.E. Assistant Admissions Officer (Off-Campus Credit Program and College Liaison)
S. A. GAULT, B.A., Assistant Registrar
L. GUNTHER, Assistant Admissions Officer (Orientation and School Liaison)
H. J. KING, Assistant Registrar
L. P. MORGAN, B.A., Associate Registrar
K. LIM, B.A., Administrative Officer

242.13.22 RESEARCH GRANTS AND CONTRACTS OFFICE

G. A. HOLMES, B.Com., Dip. M. & B.A., A.C.I.S., Research Grants and Contracts Officer

242.13.23 SECRETARIAT

M. M. McCAUGHAN, B.A., LL.B., LL.M., Executive Assistant to the President
A. L. PATERSON, B.A., B.Sc., Adminstrative Officer
E. A. SOLOMON, B.A., M.A., Secretary to General Faculties Council
L. M. PLASKITT, Ph.D., Administrative Officer

242.13.24 SPECIAL SESSIONS OFFICE

K. L. CARSWELL, B.Com., Director
M. G. WADSWORTH, B.A., Administrative Officer

242.13.25 STUDENT SERVICES

B. M. SMITH, B.A., M.A., Ph.D., Senior Administrator, Native Affairs, Student Affairs, Student Awards, Student Counselling and Dean of Students

242.14.26 OFFICE OF THE ADVISER ON NATIVE AFFAIRS

E. METATAWABIN, Adviser
R. SAYERS, Executive Secretary

242.13.27 STUDENT AFFAIRS

R. GROBERMAN, Director of Student Affairs and International Student Adviser
F. TREHEARNE, Student Adviser
L. MAH-SEN, CUSO Co-ordinator
M. NICELY, Co-ordinator, Study and Travel Abroad Program
R. COUTTS, CIDA Coordinator

242.13.28 STUDENT AWARDS OFFICE

L. HENDERSON, B.A., Administrator

242.13.29 STUDENT COUNSELLING SERVICES

P. C. SARTORIS, Ph.D., Director
R. A. DAVIS, Ph.D., Counsellor
W. F. EPLING, Ph.D., Counsellor
R. F. FISCHER, Ph.D., Counsellor
R. C. KIMMIS, Ph.D., Counsellor
R. M. LIBURD, M.S.W., Counsellor
M. C. ROTH, Ph.D., Counsellor
A. R. VANDER WELL, Ph.D., Counsellor
E. CHAMBERS, B.A., Administrative Assistant

242.13.30 TECHNICAL SERVICES

W. H. JOPLING, B.Sc. (Civil Eng.), Director

242.13.31 UNIVERSITY ARCHIVES

J. M. PARKER, B.A., M.A., Dipl. Archives Administration, University Archivist
G. C. POMAHAC, B.A., M.L., Assistant Archivist

242.13.32 UNIVERSITY BOOKSTORE

J. C. MALONE, B.Com., Bookstore Manager

242.13.33 UNIVERSITY HEALTH SERVICE

F. B. COOKSON, B.Sc.(Hons), M.D., Obst. D.R.C.O.G., M.C.E.P., Director
J. A. EDDINGTON, M.B., M.D., B.Chir., M.R.C.S., L.R.C.P., M.C.F.P. Physician
J. HARVEY, M.D. Physician
H. KUCKERTZ, M.D. Physician
V. V. MAQUBELA, M.D., Physician
J. T. YONEDA, M.D. C.C.F.P. (Physician)
Y. YONEDA, M.D., F.A.C.S., F.R.C.S.(C), Gynaecologist
P. A. JAMIESON, R.N., Administrative Officer

242.13.34 UNIVERSITY PRESS

P. BANKS, R.I.A., Business Manager
N. D. GUTTERIDGE, Director
S. VANCE, Editor.

243 UNIVERSITY LIBRARIES

243.1 Administration

Librarian to the University
B. B. PEEL, B.A., M.A., B.L.S.

Associate Librarian
G. G. TURNER, B.A., LL.B., B.L.S.

243.1.1 LIBRARY SUPPORT SERVICES

Head
R. E. BANKS, B.A., M.L.S., R.I.A.

Professional Officers
R. G. BARTER, B.A.
J.D. TESKEY, B.A., M.L.S.

243.1.2 LIBRARY SYSTEMS

Head
J. HEILIK, B.A., B.L.S.

243.2 Public Services

Assistant Librarian—Public Services
C. D. EVANS, B.A., B.D., B.L.S., Th.M.

243.2.1 CIRCULATION SERVICES AND UNDERGRADUATE LIBRARY

Head
E. SCHWOB, B.A., B.L.S.

Professional Officer
J. G. SCHOVANEK, A.B., M.A., Ph.D

Senior Librarians
E. J. HOUSCH, B.A., B.L.S.
C. JAMES, B.A., B.L.S.
B. SCARNATI, B.A., B.L.S., B. Ed.

243.2.2 COLLECTION DEVELOPMENT

Head
O. B. MURRAY, B.A., M.L.S.

243.2.3 EDUCATION LIBRARY

Head
B. J. BUSCH, A.B., A.M.L.S., M.A.

Senior Librarians
L. AITKEN, B.A., B.L.S.
D. DANCIK, B.A., M.L.S.
S. M. EMPEY, B.Ed., B.L.S.
M. C. MACGOWN, M.A., B.L.S., M.Ed.

Librarians
J. C. CARTER, B.Sc., M.A., M.L.S.
K. DE LONG, B.A., M.L.S.

243.2.4 HEALTH SCIENCES LIBRARY

Head
P. J. RUSSELL, B.A., B.L.S.

Librarians
S. CHETNER, B.A., B.L.S.
P. GODDARD, B.A., M.A., M.L.S.
L. K. STARR, B.Sc., M.L.S.

243.2.5 HUMANITIES AND SOCIAL SCIENCES LIBRARY

Head
M. L. SHARMA, B.A., M.S.L.S.

Principal Librarians
M. FARNELL, B.A., B.S.L.S.
S. S. MANWARING, B.A., B.L.S.
E. OLSON, B.A., B.L.S.

Senior Librarians
A. ALTMANN, B.A., M.A., B.L.S.
P. de HAAS, B.A., M.A., M.L.S.
G. LEWIS, B.A., M.A., M.S.L.S.
F. MIELKE, B.A., B.L.S.
M. J. MUSAFIR, B.A., M.A., M.A.L.S.
J. D. POFF, B.A., M.A., M.L.S.
C. D. SHARPLIN, B.A., B.L.S.
J. K. WIKELEY, B.A., A.L.A., M.I.L.

Librarians
N. BOCK, B.A., M.L.S.
I. C. LANGHAMMER, B.A., M.L.S.

243.2.6 LAW LIBRARY

Head
L. V. MacPHERSON, B.A., M.L.S.

Senior Librarians
C. M. EWASKIW, B.Ed., B.L.S.
S. P. REMPEL, B.A., B.L.S.

243.2.7 SCIENCE LIBRARY

Head
(To be appointed)

Senior Librarians
D. L. JONES, B.Sc., M.L.S.
V. KUNDA, B.Sc., B.L.S.
M. E. PYRCH, B.Sc., B.L.S.

Librarians
J. MILETICH, B.A., M.L.S.

243.2.8 SPECIAL COLLECTIONS

Head
J. W. CHARLES, A.B., M.L.S.

Senior Librarian
A. ALTMANN, B.A., M.A., B.L.S.

243.3 Technical Services

Assistant Librarian-Technical Services
D. NODEN, B.A., M.A., B.L.S.

243.3.1 ACQUISITIONS

Head
S. E. ROONEY, B.A., M.A., B.L.S.

243.3.2 BIBLIOGRAPHIC VERIFICATION

Head
B. E. HOBBS, B.A., B.L.S.

Senior Librarians
W. S. ALLISON, B.A., B.Ed., M.A., M.L.S.
A. M. RUTKOWSKI, B.A., M.A., M.A. in L.S.
G. L. VALLI, B.A., B.L.S.
S. VanHAITSMA, B.Sc., B.L.S.

243.3.3 CATALOGUING AND RECORDS

Head
S. LASKOWSKI, B.A., B.L.S.

Principal Librarians
M. JAMIESON, B.A., B.L.S.,
M. B. STOROZUK, B.A., B.L.S.

Senior Librarians
N. BRIDGE, B.A., Dip. NZLS
K. CARTER, B.A., B.L.S.
A. K. CHAN, B.A., M.L.S.
M. DOUGLAS, B.A., M.L.S.
A. M. EIKELAND, B.A., A.M.L.S.
Y. FENTON, B.A., A.L.A.
V. LUTZAK, B.A., B.L.S.
T. PAAP, B.A., B.L.S.
T. M. VASQUEZ, B.Sc., M.L.S.
J. WU, B.A., M.A., M.L.S.

Librarians
S. AQUILA, B.A., M.L.S.
P. FIGUEROA, B.A., B.S.L., M.L.S.
M. C. HAMILTON, B.A., B.L.S.
V. JANSSEN, B.Ed., M.L.S.
A. KUJANSUU, B.A., M.A., B.L.S.
M. MAY, B.Mus., M.L.S.
M. H. McCLARY, B.A., Dipl. in Ed., M.L.S.
A. SIRKO, B.A., M.A., Dipl. in Ed., M.L.S.
V. VUKOV, B.Sc., M.Sc., B.L.S.

243.4 General Information

The libraries of The University of Alberta contain more than 2,000,000 volumes, 500,000 documents, 15,000 periodical subscriptions, audio visual aids and a large collection of research materials in microform.

The Humanities and Social Sciences Library is located in the Rutherford Library complex with some units in the Cameron Library. The main book collection and the union catalogue for the campus are located in Rutherford Library North. Here also, on the second floor, are the Reference and the Circulation Services. The Periodicals Reading Room, located on the 2nd floor of Rutherford South, contains current issues of periodicals in the humanities and social sciences plus recent issues of Canadian and foreign newspapers. Bound periodicals are located on the second floor and tiers 4, 5 and 6 of Rutherford South.

In the Cameron Library the Humanities and Social Sciences collections include the Government Publications on the third floor and Micromaterials Reading Room in the basement. The Cameron basement also houses Special Collections, Interlibrary Loan service and Duplicating Services.

In the Cameron Library the Undergraduate Library on the second floor contains an open shelf collection of over 80,000 volumes specially selected to meet the needs of undergraduates during their first two years of study. The Reserve Reading Room on the first floor houses books which are assigned by the instructors as required reading in the arts and sciences.

The Science Library occupies the fourth floor of the Cameron Library, and contains material for use in the fields of agriculture, engineering, science, home economics and other related subjects. The head of this Library is also responsible for two small branch libraries in related fields; the Mathematics Library located in the Central Academic Building, and the Physical Sciences Library in the Physics-Chemistry Building.

The Health Sciences Library on the fifth floor of the Cameron Library houses books and periodicals in the fields of medicine, dentistry, nursing, pharmacy, rehabilitation medicine and health services administration. This Library operates one branch at the University Hospital, the John W. Scott Library, which may be used by all recognized University Library patrons, but is mainly for use by the faculty and house staff at the hospital.

The Weir Memorial Law Library is housed in the Law Centre located on 111th Street. The Law Library contains reports, statutes, digests, encyclopaedias, treatises for Canada, the provinces, Great Britain and many of the other Commonwealth countries. United States' materials include the National Reporter system, the American Digest, Shepards Citators, annotated state codes, federal statutes and regulations. Over 1,200 periodicals are received with complete files of the major periodicals. Special subject collections are being established in: Oil and Gas, Taxation, International Law and Comparative Law.

The other major library on the campus is the Herbert T. Coutts (Education) Library which occupies the three-storey east wing of the Education Building. Circulation and reference services as well as a card catalogue of the Library's holdings are maintained here. The head of this Library also supervises the Curriculum Materials Library on the lower floor of the building.

244.1 Alberta Institute of Pedology

The Institute of Pedology is an organization of soil scientists with headquarters at the University. It was organized in 1968 by agreement between the University, the Research Council of Alberta, and the Research Branch of the Canada Department of Agriculture. The Institute consists of all pedologists in the Soil Science Department of the University, the Soils Department of the Alberta Research Council and the Alberta Pedology Unit of the Land Resources Research Institute, Agriculture Canada.

The Institute co-ordinates work in the following fields: soil survey in Alberta, research in pedology, compilation and publication of information on soils, interpretation of basic data on Alberta soils for use by all disciplines, and the clearing of requests for assistance and/or co-operation from other institutions concerned with pedological data.

The Institute is authorized to accept funds in support of investigations requested by donors. The Technical Co-ordinating Committee may administer funds, exclusive of the budgets of the co-operating institutions, accepted by the Institute to assist it in achieving its objectives.

The Chairman of the Soil Science Department of the University is ex-officio Chairman of the Technical Co-ordinating Committee.

244.2 Boreal Institute for Northern Studies

See § 98.1 of this Calendar.

244.3 Cancer Research Institute

See § 121.3.5 of this Calendar.

244.4 Center for Advanced Study in Theoretical Psychology

See § 98.3 of this Calendar.

244.5 Centre for the Study of Mental Retardation

See § 98.4 of this Calendar.

244.6 Institute of Earth and Planetary Physics

Council of the Institute
S. W. WOODS, Ph.D., Chairman
K. B. NEWBOUND, Ph.D.
N. W. RUTTER, Ph.D
A. N. KAMAL, Ph.D
R. G. IRONSIDE, Ph.D
together with the Director, Associate Director and Academic Staff listed below

Director
G. R. CUMMING, Ph.D.

Associate Director
E. R. REINELT, Ph.D

Academic Staff
R. B. CHARLTON, Ph.D.
M. E. EVANS, Ph.D.
D. I. GOUGH, Ph.D., F.R.S.C., F.A.G.U.
J. GRAY, Ph.D.
K. D. HAGE, Ph.D.
F. HRON, D. Nat. Sci.
F. W. JONES, Ph.D.
E. R. KANASEWICH, Ph.D., F.R.S.C.
E. P. LOZOWSKI, Ph.D.
E. NYLAND, Ph.D.
D. RANKIN, Ph.D.
G. ROSTOKER, Ph.D.
J. SAMSON, Ph.D.
T. J. T. SPANOS, Ph.D.

The Institute of Earth and Planetary Physics was founded in 1970 with the aid of a Negotiated Development Grant from the National Research Council. Its support has since been assumed by the University. The Institute unites geophysicists in the Department of Physics and meteorologists in the Department of Geography for the promotion of research in earth and planetary physics. The scientific members of the Institute include the academic staff listed above, about 10 research associates and about 50 graduate students registered in the two Departments. Technical assistance is provided by staff of the Departments of Physics and Geography. One or more Distinguished Visitors are invited each year for two or three months.

Research topics in which Institute members are active include seimology, geomagnetism, electromagnetic induction in the Earth, paleomagnetism and rock magnetism, plate tectonics, time series analysis, mass spectrometry applied to geochronology and to stable isotopes, synoptic-scale and local-scale meteorological studies including studies of atmospheric and oceanic pollution, and space physics especially of the magnetosphere and environment of the Earth-Sun system.

244.7 Institute of Law Research and Reform

Board of Directors
W. E. WILSON, Q.C., Chairman
J. W. BEAMES, Q.C.
W. F. BOWKER, Q.C., Director Emeritus
E. GAMACHE
R. G. HOPP
C. D. HUNT
W. H. HURLBURT, Q.C.
L. C. LEITCH
D. B. MASON, Q.C.

Legal Staff
W. H. HURLBURT, Q.C., Director
G. C. FIELD, Associate Director
T. W. MAPP, Associate Director
M. A. SHONE, Counsel
M. G. BRIDGE
J. L. DEWAR
M. D. MacNAIR
D. B. McLEAN
I. D. C. RAMSAY

The Institute of Law Research and Reform was established in November, 1967, by agreement between

the Provincial Government, the Law Society of Alberta, and the University. Its objects are twofold: to promote law reform, particularly at the provincial level, and to encourage legal research in co-operation with the Faculty of Law. By February, 1979 the Institute had made 35 Reports to the Government in connection with law reform, covering a wide range of subjects. Projects on foot include revisions of the Land Titles Act and Companies Act; Labour Management Relations; Limitation of Actions; a number of projects in Family Law; Judicial Reviews of Administrative Proceedings; Evidence; Exemptions from Execution; Wage Garnishment and Confidentiality and Freedom of Information. In its promotion of legal research as distinct from law reform the Institute has made to members of the Faculties of Law of the University of Alberta and the University of Calgary a number of grants which have produced useful research.

244.8 *R. S. McLaughlin Examination and Research Centre*

See § 121.3.6 of this Calendar.

244.9 *Population Research Laboratory (PRL)*

Director
L. W. KENNEDY, Ph.D.

Research Associates
J. ADDICOTT, Ph.D., Zoology
T. L. BURTON, Ph.D., Recreation Administration
J. FORSTER, Ph.D., Graduate Studies and Research
K. L. GUPTA, Ph.D., Economics
C. HOBART, Ph.D., Sociology
R. IRONSIDE, Ph.D., Geography
G. K. JARVIS, Ph.D., Sociology
A. KAYANI, Ph.D., Alberta Social Services and Community Health
L. KOSINSKI, Ph.D., Geography
P. KRISHNAN, Ph.D., Sociology
K. KROTKI, Ph.D., Sociology
W. McVEY, Ph.D., Sociology
C. MEILICKE, Ph.D., Health Services Administration
K. MORGAN, Ph.D., Genetics
D. MURRI, Ph.D., Rural Economy
A. NAKAMURA, Ph.D., Business Administration and Commerce
M. NAKAMURA, Ph.D., Business Administration and Commerce
R. SILVERMAN, Ph.D., Sociology
E. SNIDER, Ph.D., Sociology
T. H. WHITE, Ph.D., Sociology

Faculty Service Officer
N. M. LALU, Ph.D., Sociology

The Population Research Laboratory is a research arm of the Department of Sociology, established in 1966 as the sole demographic and urban research unit in Western Canada. The PRL consists of permanent staff and research associates recruited from among faculty members, from members of other departments and from the community at large who have research interests in population and/or urban studies.

The objectives and function of the Population Research Laboratory cover four major directions: teaching of students within the sociology programs; service of an intra- and inter-departmental nature as well as to the larger community; research in population and urban studies; publications and conferences. The largest publication projects are *Canadian Studies in Population*, a bilingual journal, published jointly with the Canadian Population Society; and the three series: (1) Discussion Papers, (2) Reprints, and (3) Edmonton Area Series. The quarterly newsletter "In Summary" provides information on current projects, seminars and reports.

Research Projects carried out by the laboratory staff and research associates cover a wide range of areas: population studies that focus on demographic methodology, fertility, mortality, population projections, and sample designs; and urban studies including such areas as urbanization, housing and urban lifestyles. The PRL conducts annually the *Edmonton Area Study* which is an amalgam survey of Edmonton residents; gathering basic demographic data and data on special research problems.

In 1978, *The Centre for Criminological Research* became a part of the Population Research Laboratory. The major functions of the Centre include the research training of students and the conduct of research in crime and delinquency.

244.10 *Surgical-Medical Research Institute*

See § 121.3.4 of this Calendar.

244.11 *The Nuclear Research Centre*

Director
G. C. NEILSON, Ph.D.

Academic Staff
J. M. CAMERON, Ph.D.
W. K. DAWSON, Ph.D.
P. KITCHING, Ph.D.
W. J. McDONALD, Ph.D.
G. A. MOSS, Ph.D.
W. C. OLSEN, Ph.D.
G. ROY, Ph.D.
J. T. SAMPLE, Ph.D.
D. M. SHEPPARD, Ph.D.
H. S. SHERIF, Ph.D.

Research Staff
R. ABEGG
E. B. CAIRNS
J. B. ELLIOTT
W. E. FASZER, Ph.D.
H. W. FIELDING
P. W. GREEN, Ph.D.
L. G. GREENIAUS, Ph.D.
D. P. GURD, Ph.D.
D. HUTCHEON, Ph.D.
S. T. LAM
C. A. MILLER, Ph.D.
J. SOUKUP, Ph.D.
G. M. STINSON, Ph.D.
H. S. WILSON

The Nuclear Research Centre conducts studies to determine the fundamental properties of the nucleus of atoms. The central facility for research is a seven million volt Van de Graaff accelerator. In addition the present staff is directly involved in the experimental program of the 500 million electron volt cyclotron at Vancouver (TRIUMF Project). This is a co-operative project of The University of Alberta, the University of British Columbia, Simon Fraser University, and the Uni-

versity of Victoria. The centre offers research fellowships to physicists for research in nuclear physics.

244.12 The Theoretical Physics Institute

Director
H. SCHIFF, Ph.D.

Honorary Members
D. D. BETTS, Ph.D.
H. FROHLICH, Ph.D., F.R.S.
L. E. H. TRAINOR, Ph.D.
M. WYMAN, Ph.D., F.R.S., University Professor

Active Members
A. B. BHATIA, Ph.D., F.R.S.C.
A. Z. CAPRI, Ph.D.
W. ISRAEL, Ph.D., F.R.S.C.
A. N. KAMAL, Ph.D.
H. J. KREUZER, Ph.D.
H. P. KUNZLE, Ph.D.
B. V. PARANJAPE, Ph.D.
M. RAZAVY, Ph.D.
H. S. SHERIF, Ph.D.
J. STEPHENSON, Ph.D.
Y. TAKAHASHI, D.Sc.
W. R. THORSON, Ph.D.
H. UMEZAWA, Ph.D., Killam Professor

Associate Members
F. A. BARAGAR, Ph.D.
W. BROUWER, Ph.D.
B. L. CLARKE, Ph.D.

The Theoretical Physics Institute was established in 1960 to promote research in theoretical physics. The active membership is comprised of the University staff actively engaged in research in theoretical physics. Their research interests range over astrophysics, statistical physics, physical acoustics, general relativity, elementary particles, nuclear physics, non-linear fields, properties of metals and semi-conductors, quantum field theory and chemical physics.

There are also normally about a dozen postdoctoral fellows and research associates carrying out research under the direction of the permanent members. In addition, the Institute offers special visiting fellowships for periods of one month to one year to visiting physicists of distinction. A support staff of three secretaries and two computer programming analysts provides technical assistance.

244.13 Water Resources Centre

See § 98.8 of this Calendar.

245 GENERAL ALUMNI ASSOCIATION

245.1 Honorary Members

Dr. W. H. JOHNS
J. FOREST
R. N. DALBY
Dr. H. E. GUNNING
A. D. CAIRNS
A. M. ARBEAU
Dr. B. ADLER

245.2 Elected Members

H. CHOMIK
J. CLOVIS
K. DAVIDSON
H. FLEWWELLING
M. FLEWWELLING
Dr. C. GORDON-CRAIG
O. KIZLYK
O. KOCHAN
Dr. F. KOZAR
B. KRULL
Dr. W. H. LAKEY
B. McEWEN
J. E. MUCHA
T. PARKER
O. SALEY
E. SANDEN
Dr. J. C. SCOTT
E. W. THOMPSON
W. D. USHER
E. WACHOWICH

245.3 Ex-officio Members

President of Student Union
President of Graduate Student Association
Editor of Gateway

245.4 Director

A. G. MARKLE, B.A., B.J., B.Ed., M.Ed.

The General Alumni Association of the University is representative of upwards of 70,000 graduates located in every province of Canada and in many foreign countries. Its objective is to promote the welfare of the University.

Annually the Association undertakes a three-pronged program (a) to help perpetuate the interest and concerns of alumni in the University and to provide a medium for face to face communication among graduates; (b) to involve the alumni in an awareness of the changing environment in which students, faculties and administration are interacting and how these things relate to the greater society; (c) to support the University — 1. through representation by members on governing bodies; 2. through studies and recommendations on matters of University concern; 3. through financial and other resources that can be made available to the University.

The principal officers of the Alumni Association are the president and vice-president, elected annually by a mail vote of Alumni Council members. These officers are members of the Senate of the University. Two representatives of the Association serve on the Board of Governors for three year terms. Other officers include the past-president, the director, who as alumni executive secretary is a regular member of the University staff, and the honorary secretary.

As members of Convocation, graduates are automatically lifetime members of the General Alumni Association. As such, they receive when published, at no cost, issues of "The New Trail Folio", a University and Alumni publication.

There is no membership fee.

246.1 On-Campus Colleges

Two denominationally-sponsored colleges, with buildings located on the campus, are related to the University by a form of agreement described as *affiliation*, and offer certain courses that may be taken for degree credit by students of the University.

246.1.1 St. Stephen's College

ACADEMIC STAFF OF THE COLLEGE

Principal and Professor of Pastoral Psychology and Theology and Lecturer in Old Testament
The Rev. G. I. MUNDLE, B.A., M.Div., S.T.M., D.Min.

Coordinator of Continuing Education
The Rev. D. J. AUTEN, B.A., B.D., M.A.

Director, Doctor of Ministry Program
The Rev. W. J. CLOSE, M.A., B.D., Dr.Theol.

Lecturer in New Testament
The Rev. D. J. C. ELSON, B.D., M.A., D.D.

Lecturer in Counselling
The Rev. D. COSSAR, B.A., B.D., S.T.M., D.Min.

Librarian
R. SCHRAG, B.A.

GENERAL INFORMATION

St. Stephen's College, a graduate theological school of the United Church of Canada established by Provincial Charter, has been affiliated with the University since 1909 and currently is working on a broadly ecumenical basis, integrating theology with practice and experience.

COURSES OFFERED FOR UNIVERSITY CREDIT

By an arrangement with the University, courses in Biblical Literature taught in St. Stephen's College are open to students of the University, for credit towards the Bachelor of Arts degree or as Arts options open to students in other faculties.

O NTL 352. *Old Testament Literature.* ★3 (First Term, 3-0-0). Origins, development, composition, context, content, literary qualities and personalities of the various books of the Old Testament.

O NTL 353. *New Testament Literature.* ★3 (Second Term, 3-0-0). Jewish and Greek environment of the New Testament; the authorship and content of its various books, and the process of New Testament formation.

NON CREDIT

In addition to the above a variety of short-term non-credit courses of a professional and interdisciplinary nature offered for professional church workers and laity are open to members of the University.

DEGREE COURSES

The College offers graduate theological degrees: a professional Doctor of Ministry (D.Min.) and an academic Master's Degree (Th.M.). Enquiries may be directed to the office, 439-7311.

246.1.2 St. Joseph's College

ACADEMIC STAFF OF THE COLLEGE

Principal
A. A. M. de Valk, csb, M.A., S.T.B.

Registrar
BRO. DONATUS (VERVOORT), ndl, M.A.

PHILOSOPHY

Associate Professor, and Coordinator
B. D. INGLIS, csb, Ph.D.

Assistant Professors
J. A. BUIJS, M.A., Ph.D.
D. G. MACDONALD, csb, M.A.

THEOLOGY

Associate Professors
J. J. F. FIRTH, csb, M.A., M.S.D.
J. C. GALLAGHER, csb, S.T.D. (Church and Society)

Associate Professor
A. A. M. de VALK, csb, M.A., S.T.B. (Church History)

Assistant Professor
D. GEERNAERT, S.Ch., M.A., Ph.D. (Systematic Theology)

Lecturers
P. FACHET, omi, S.T.L., L.S.S. (Biblical Studies)
B. GLENDINNING, Dip. S.Lit. (Sacramental Theology)
D. LOUCH, cssr, M.A., Ph.D. (Theology)
J. F. MADDEN, csb, M.A., Ph.D. (Theology)
D. MCLEOD, csb, M.A., M.Div. (Theology) (on leave)
M. MILLER, cssr, B.Sc., M.A., M.Div. (Biblical Studies)
M. MOSER, omi, L.Ph., L.Th. (Theology)
M. SOLOVEY, osbm, Ph.D., D. Eccl. S. (Eastern Theology)
R. WOLAK, omi, L.Ph., L.Th. (Moral Theology)

Librarian
J. B. JANISSE, csb, A.M.L.S.
P. J. SHEEDY, B.A., M.L.S.

IN RESIDENCE

R. A. PENDERGAST, csb, Ph.D.
Associate Professor of Economics
C. GORDON-CRAIG, Ph.D., Associate Professor of English
Dean of Residence

GENERAL INFORMATION

St. Joseph's College is established under the authority of the Roman Catholic Church, and directed by the Congregation of St. Basil (Basilian Fathers). It was affiliated with the University by resolution of the Senate, May 31, 1926.

COURSES OFFERED FOR UNIVERSITY CREDIT

Christian Theology

For courses taught by St. Joseph's College in Christian Theology see the Faculty of Arts Calendar § 44.8.

Philosophy

For courses taught by St. Joseph's College in Philosophy see the Faculty of Arts Calendar § 44.29.4.

246.2 Off-Campus Colleges

Three private colleges are related to the University of Alberta by affiliation agreements under which certain courses offered by the colleges will be accepted for

University credit. These colleges are: Camrose Lutheran College, Camrose; Canadian Union College, College Heights; and Concordia Lutheran College, Edmonton.

Formal affiliation agreements no longer exist between the University and the public colleges of the Province. However, provisions have been made for the transfer of students from these and other post-secondary educational institutions in Alberta (See § § 13.21 and 14.4 of this calendar).

247 ASSOCIATED INSTITUTIONS AND AGENCIES

247.1 *Canadian Institute of Ukrainian Studies*

See § 98.2 of this Calendar.

247.2 *Division of Community Development*

See § 98.6 of this Calendar.

247.3 *Devonian Botanical Garden*

See § 98.5 of this Calendar.

247.4 *Division of East European Studies*

See § 98.7 of this Calendar.

247.5 *Northern Health Services Program*

See § 121.3.2 of this Calendar.

247.6 *The Provincial Laboratory of Public Health*

Director and Provincial Bacteriologist
J. M. S. DIXON, M.D., F.R.C.P. (c)

Deputy Medical Director, Edmonton Laboratory
C. H. JELLARD, D.M.

Microbiologists
M. C. FINLAYSON, Ph.D.
R. P. B. LARKE, M.D., D.Cl.Sc.
O. MORGANTE, M.D., Ph.D.
E. M. SCHALLIBAUM, M.B.
A. S. SEKHON, Ph.D.

Consultant
F. L. JACKSON, M.B. (Bacteriology)

Director, Southern Branch Laboratory, Calgary
C. M. ANAND, M.B., F.R.C.P. (c)

Microbiologist
S. M. GUBASH, M.D., F.R.C.P. (c)

The Provincial Laboratory of Public Health has branches both at Calgary and Edmonton. The Laboratory is administered by The University of Alberta. Many of the senior staff members of the Edmonton laboratory are also members of University departments.

247.7 *The Research Council of Alberta*

President
G. G. CLOUTIER, Ph.D.

Director, Policy Development and Program Evaluation
R. GREEN, Ph.D.

Secretary of Council
D. M. HOLLANDS

ADMINISTRATION DIVISION

Acting Director
R. GREEN, Ph.D.

Director of Personnel
D. M. PECKHAM, B.Sc.

Acting Head, Finance Department
J. PATERSEN, B. Com.

Manager, Drafting Services
W. HUTNIAK

Chief Librarian
S. M. GEE, B.L.S.

Manager, Editing Services
W. F. TUCK, B.A.

Purchasing Agent
H. KAY

Safety Coordinator
E. J. PARRANTO

ENERGY RESOURCES DIVISION

Director
J. G. DOUGLAS, Ph.D.

Head, Oil Sands Research Division
R. G. MARTIN, M.Sc.

Head, Coal Research Department
M. P. DU PLESSIS, Ph.D.

FRONTIER SCIENCES DIVISION

Director
D. J. CURRIE, Ph.D.

Head, Chemistry Department
M. A. KESSICK, Ph.D.

Manager, Biology
T. KANEDA, D. Sc.

Acting Manager, Computing
P. REDBERGER, B.Sc.

NATURAL RESOURCES DIVISION

Director
E. A. BABCOCK, Ph.D.

Acting Head, Atmospheric Sciences Department
B. BARGE, Ph.D.

Head, Soils Department
J. D. LINDSAY, M.S.A.

Acting Head, Groundwater Department
G. GABERT, M.Sc.

Head, Geological Survey
G. D. MOSSOP, Ph.D.

INDUSTRIAL AND ENGINEERING DIVISION

Director
D. L. MITCHELL, Ph.D.

Head, Industrial and Engineering Services Department
J. HOLUB, B.Sc.

Head, Transportation and Surface Water Engineering Division
B. P. SHIELDS, M.Sc.

Acting Program Head, Solar and Wind Energy
P. C. WILLIAMS, M.A.

Head, Gasoline and Oil Testing Laboratory
G. M. STOTT, B.Sc.

Supervisor, Machine Shop
S. W. HOLLEMEYER

Supervisor, Instrument Repair
J. A. KINASEWICH

GENERAL INFORMATION

The Research Council of Alberta was originally formed in 1921 by the Province and the University for the general purpose of conducting economic research into the natural resources of the Province. For many years it was housed in University buildings and its head office is presently located on the campus at 11315-87 Ave, with Executive offices located at: 9th floor, 9925 - 109 street, Edmonton Alberta. The Dean of Graduate Studies and Research of the University is a member of the Council.

Further information about the staff and work of the Council may be obtained directly from the Secretary of the Council.

247.8 The University of Alberta Hospitals

Members of the Hospitals Board
P. M. OWEN, B.A., LL.B., Q.C. (Chairman)
W. J. ASTLE, B.Com., F.C.A. (Vice Chairman)
P. B. R. ALLEN, B.Sc., M.D., F.R.C.S.(C), F.A.C.S.
M. HOROWITZ, Ed.D., President of the University
D. F. CAMERON, M.D., F.R.C.P.(C), F.A.C.A., Dean of the Faculty of Medicine
I. G. FINLAY, B.Sc.
D. V. HORTON, R.N.
N. LIEBERMAN, B.Sc.
L. D. MABBOTT, B.Sc.
D. H. SPRAGUE, B.Com.

President of the University of Alberta Hospitals and Secretary of the Hospitals Board
B. SNELL, F.R.C.P., D.P.H., F.A.C.H.A.

The University of Alberta Hospital was administered by the University from 1922 to 1929. It is now administered by a board appointed by the Lieutenant Governor in Council, including the President of the University and the Dean of the Faculty of Medicine as statutory members. The hospital has a bed capacity of approximately 1,250. Students in Medicine, Dentistry, Nursing, and the other health sciences, receive instruction there.

247.9 The Western Board of Music

The Western Board of Music was founded in 1935 in order to conduct examinations of a high standard in music. In it are associated the Universities in Alberta, Manitoba, and Saskatchewan. The central office is at the University of Alberta and it is funded by the prairie universities, and from revenue derived from examination fees.

The Board awards the diplomas of Associate in Music (A. Mus.) and Licentiate in Music (L. Mus.) for the second highest and highest grades, respectively, in its examinations.

Theoretical and practical examinations are held in January, February, May and June of each year. Further details, including information about prizes and awards, are to be found in the official announcements of the Board, obtainable by writing to The Western Board of Music, The University of Alberta.

248 GLOSSARY

The entries which follow have been prepared by the Calendar Editor for information only. If needed, official definitions should be obtained from the appropriate Calendar location (italics) or from a member of the Registrar's Office.

Academic Schedule
(University Regulations Calendar — § 11)
A schedule of events and deadlines of importance to students and prospective students covering the period of the "University Year" (i.e. July 1 to June 30).

Academic Year
The term describes the period from September to April (the University's Winter Session).

Admission
Acceptance of a candidate for enrollment in a specified program and faculty.

Advanced Placement
(University Regulations Calendar — § 14.4)
The process whereby students are excused from taking a particular course (usually at the junior level) on the basis that they have already acquired the knowledge necessary to proceed into another course in the subject at a more advanced level. Advanced placement, unlike advanced standing, does not serve to reduce the number of courses that a student must complete for the degree.

Advanced Standing (transfer credit)
(University Regulations Calendar — § 14.4)
University of Alberta credit given for university level courses taken at another institution.

Aegrotat Standing
(University Regulations Calendar — § 16.2.1)
Provision whereby a faculty may grant a deserving student credit in one or more courses in which he or she has missed the final examination because of illness.

Auditor
(University Regulations Calendar — § 12.2.3(5))
A person who has been permitted to register in a course for informational instruction only. Regular attendance at classes is expected, normally without participation in assignments or examinations, and without credit.

Calendar (Catalogue)
An annual publication of academic regulations, schedules, programs of study, and course descriptions.

Candidacy Examination
(Graduate Studies Calendar — § 203.2(6))
The examination which tests doctoral students' knowledge of their discipline and of the subject matter relevant to their thesis; and their ability to pursue and complete original research at an advanced level.

Course Weight
A number, used in computing grade-point average, which reflects, to some degree, the amount of class time devoted to the course.

Credit by Special Assessment or Credit by Challenge
(University Regulations Calendar — § 14.4.3)
The procedure whereby a student may seek credit in certain specified courses without actually registering in and taking the courses at the University of Alberta. This privilege is limited to students who have been admitted to the University.

Credit Course
A course that carries credit towards a degree or diploma.

Deferred Final Examination
(University Regulations Calendar — § 16.3.5)
An examination written by a student, with permission of the student's faculty, subsequent to the regular time of writing.

Degree with Distinction
(University Regulations Calendar — § 16.4.3)
The notation which is inscribed on the permanent record and graduation parchment of a candidate for any degree, except an honors or graduate degree, if the candidate has obtained a grade-point average of 7.5 or higher over the last two years of the program.

Degree with Honors (Honors Program)
(University Regulations Calendar — § 16.4.2)
A four-year concentrated course of study under the supervision of one of the departments in the Faculty of Arts or Faculty of Science.

Enrolment Quota (limited enrolment)
A restriction on the number of students admitted to a program where there are invariably more qualified applicants than it is possible to accommodate.

Entrance Requirements
Academic background necessary for admission to a particular course of study.

Extramural Students
(University Regulations Calendar — § 12.2.2(2))
Students granted the privilege of taking one or more courses by correspondence or directed studies without having to attend the University of Alberta or any of its off-campus centres.

Faculty
A formal subdivision within the University whose mission is the administration of programs and courses relating (usually) to a grouping of fields of study and academic disciplines.

First-Class Standing
(University Regulations Calendar — § 16.4.1)
A distinction awarded to students who obtain a grade-point average of not less than 7.5 while enrolled in a full normal academic course load in the academic year in question.

Full course
A course with a weighting factor of six or greater that normally extends over two consecutive University terms.

Full-Time Students
(University Regulations Calendar — § 12.2.1(1))
Students who enrolled in the equivalent of three or more half courses in a term.

Grade-Point Average
A measure of a student's weighted average obtained by dividing the total number of grade points earned by the total weight of the courses attempted.

Grade Points
A weighted value assigned to the grade a student receives in a course obtained by multiplying the grade by the course weight. Used in computing grade-point averages.

Graduate Student
(University Regulations Calendar — § 12.2.1(2))
Students admitted to the Faculty of Graduate Studies and Research.

Half Course
A course with a weighting factor of less than six that normally extends over one University term.

Interdepartmental Course

A course that is offered jointly by two or more departments, not necessarily in the same Faculty.

Intersession (May-August Summer Period)

(University Regulations Calendar — § 15.1.6,Graduate Studies Calendar — § 202.3.3)

A period for which Graduate Studies students who are working full-time on their graduate program record their presence.

Intramural students

(University Regulations Calendar — § 12.2.2(1))

Students who are attending the University of Alberta or any of its off-campus centres.

Mature or Non-matriculated Students

(University Regulations Calendar — § 13.22)

Residents of Alberta, the Yukon, or the N.W. Territories who are at least 21 years of age and who are given permission to enroll in a degree program although they do not meet the regular admission requirements.

Mid-Session Examination

The examination written at the end of the first term of a session (e.g. in December). For single term courses the examination will be a final. For full session courses it will be a mid-term examination.

Part-Time Student

(University Regulations Calendar — § 12.2.1(ii))

Students who are enrolled in the equivalent of fewer than three half courses in a term.

Reading Week

A recess near the middle of the Second Term designed to allow students to catch up on outstanding reading and to prepare for oncoming final examinations.

Reappraisals

(University Regulations Calendar — § 16.3.6)

The privilege of having the final examination paper re-read in a particular course.

Registration

Advance Registration

A system of registration that allows continuing students to register in their program or courses in the spring of the year for the following winter session.

In-Person Registration

A system of registration conducted in the fall of the year in the week prior to the commencement of classes.

Late Registration

A system of registration which provides for students to register for a limited number of days beyond the in-person registration period.

Residence Requirements

(University Regulations Calendar — § 16.1)

A student proceeding towards a first (bachelor's) degree must complete a minimum of one full year's program of studies at The University of Alberta. Normally these studies will constitute the final year of the program.

Seminar

A group of students which meets regularly for reports and discussions in an area of research under the guidance of a professor.

Session

A period of lessons and study. See Spring Session, Summer Session, Winter Session and Term.

Spring Session

The six week teaching session which covers the period from the first week of May to the second week of June, inclusive.

Statement of Results

(University Regulations Calendar — § 16.8.2)

An unofficial copy of the student's year-end academic results, with neither an original signature nor a seal.

Summer Session

The six weeks teaching session which covers the period from the first week of July to the second week of August, inclusive.

Supplemental Examination

(University Regulations Calendar — § 16.3.4)

The provision whereby a student may be granted a further examination in a course if his or her standing following the final examination is unsatisfactory.

Term

Each session (Summer, Winter, Spring) is divided into two terms of equal length for the purposes of registration and the scheduling of classes and examinations.

Term Examination

(University Regulations Calendar — § 16.3.1)

An examination which is conducted prior to the time that the instructional portion of a course has been completed.

TOEFL

(University Regulations Calendar — § 14.3)

Test of English as a Foreign Language.

Transcript

(University Regulations Calendar — § 16.8.2)

A statement of the student's entire official academic record bearing the original signature of an authorized member of the Registrar's staff and the official seal of the University.

Tutorial

Instruction given to students individually or in small groups.

Undergraduate Student

(University Regulations Calendar — § 12.2.1(1))

Students registered in a faculty other than the Faculty of Graduate Studies and Research.

Weighting Factor

A unit used in the calculation of a student's overall grade-point average. In most faculties a weight of six is assigned to a full session course (or equivalent) and a weight of three to a single term course.

Winter Session

The twenty-six weeks' teaching session which commences near the beginning of September and concludes in April.

Withdrawal

(University Regulations Calendar — § 15.2.3)

The voluntary cancellation of registration by a student who completes "Notice of Withdrawal" forms. The student notifies the appropriate authorities, thereby making it an "Official Withdrawal". When the student merely stops attending classes without notifying authorities, or withdraws after the deadline, failing marks may be recorded. This is termed "Unofficial Withdrawal".

University Staff

251 FULL-TIME ACADEMIC STAFF

NOTE: The following is a list of full-time academic staff in 1980-81. Appointments taking effect in 1981-82 have not been included. In addition, the ranks shown are 1980-81 ranks; any promotions which take effect in 1981-82 have not been included. The two years shown in parentheses at the end of each entry are: first year — the year of first full-time appointment to the University; second year — the year of attainment of the current rank.

ABBOTT, Harvey Leslie, BA (Memorial), MSc PhD (Alberta), Professor of Mathematics (1967, 1977).

ABU-LABAN, Baha R., BA MA (Beirut), PhD (Washington), Professor of Sociology (1961, 1971).

ABU-LABAN, Sharon M. C., BA (Washington), MA PhD (Alberta), Associate Professor of Sociology (1975, 1979).

ADAMS, Peter Frederick Gordon, BEng MEng (N.S. Tech. College), PhD (Lehigh), Professor of Civil Engineering and Dean of Engineering (1960, 1971).

ADAMS, Wesley J., BS MSSW (Wisconsin), PhD (Oregon), Professor of Home Economics (1971, 1978).

ADAMS, William Sanderson, BSc MSc (Alberta), Associate Professor of Computing Science (1962, 1966).

ADDICOTT, John F., AB (California), MS PhD (Michigan), Associate Professor of Zoology (1973, 1979).

ADLER, John G., BSc MSc (British Columbia), PhD (Alberta), Professor of Physics (1967, 1972).

AFANASIFF, Bonnie G., BA, MA (Alberta), Administrative Professional Officer in the the Office of the Registrar (1978, 1980).

AFFLECK, Alan Ferguson, BPHE (Toronto), BEd (Alberta), MS (Indiana), Professor of Recreation Administration (1951, 1972).

AFFOLDER, Wallace E., Systems Supervisor (Academic) in Office of Administrative Systems, (1969, 1971).

AHERNE, Francis X., BS, MS (Dublin), PhD (Iowa), Professor of Animal Science (1972, 1979).

AHMED, Asad, BSc MSc PhD (Aligarh), PhD (Yale), Professor of Genetics (1967, 1977).

AITKEN, Leslie, Teaching cert. BA, BLS (Alberta), Professional Librarian (1980, 1980).

AKABUTU, John J. MD (Dalhousie), Associate Professor of Paediatrics, University of Alberta; Associate Professor of Medicine, W. W. Cross Cancer Institute (1972, 1975).

ALDERMAN, Richard B., BPE MPE (British Columbia), EdD (California), Professor of Physical Education (1965, 1974).

ALGEO, James E., BA (Sacramento State College), MA PhD (Wisconsin), Associate Professor of Romance Languages (1975, 1975).

AL-HUSSAINI, Ata N., BSc (Iraq), MSc (Purdue), PhD (Illinois), Associate Professor of Mathematics (1968, 1976).

ALI, S. M. Farouq, BEng (Karachi), BSc (Birmingham), MSc PhD (Pennsylvannia), Professor of Mineral Engineering (1978, 1978).

ALLAIRE, Gratien, Professeur adjoint, Faculté Saint-Jean (1979, 1979).

ALLBON, Leonard G., BOT (Alberta), TDip (London), MBAOT (London), OTReg (c), Associate Professor of Occupational Therapy (1960, 1970).

ALLEGRETTO, Walter, BASc PhD (British Columbia), Associate Professor of Mathematics (1970, 1975).

ALLEN, Theresa M., RT (Ottawa General Hosp.), BSc (Ottawa), PhD (Dalhousie), Assistant Professor of Pharmacology (1977, 1977).

ALLEN, Willard Finlay, BSc (W. Ontario), MA PhD (Toronto), Associate Vice-President (Finance and Administration) and Professor of Chemistry (1948, 1971).

ALLISON, Bruce N., BSc (Alberta), PhD (Yale), Associate Professor of Mathematics (1971, 1977).

ALLISON, Scott, BA BEd (Alberta), MA (Middlebury), MLS (Maryland), Professional Librarian (1969, 1969).

ALMON, Bert L., BA (Texas), MA PhD (New Mexico), Associate Professor of English (1968, 1975).

AL-SALAM, Nadhla Abdul-Halim, BS (Baghdad), MA PhD (Duke), Associate Professor of Mathematics (1966, 1978).

AL-SALAM, Waleed A., BS MA (California), PhD (Duke), Professor of Mathematics (1966, 1967).

ALTMANN, Anna E., BA BLS (Alberta), MA (Cornell), Professional Librarian (1974, 1974).

AMY, Roger A., MD (Alberta), Associate Professor of Pathology (1972, 1979).

ANAND, Chandar M., MB, BS (Bombay), MRC Path. Director of Provincial Laboratory — Calgary (1976, 1976).

ANDERSON, Arnette M., RN (Saskatchewan), BN (McGill) MScN (Texas), Assistant Professor of Nursing (1979, 1979).

ANDERSON, A. Wayne, BSc MSc (Alberta), Associate Professor of Agricultural Engineering (1976, 1976).

ANDERSON, Charles Campbell, MA MEd (Glasgow), PhD (Cambridge), Professor of Educational Psychology (1957, 1963).

ANDERSEN, Kenneth F., BSc (British Columbia), MSc PhD (Toronto), Associate Professor of Mathematics (1971, 1976).

ANDERSON, Kenneth Owen, BSc MSc (Alberta), Professor of Civil Engineering (1957, 1972).

ANDERSON, Marjorie C., RN BSc (Alberta), MN (Washington), Assistant Professor of Nursing (1979, 1979).

ANDERSON, Roland F., BA (British Columbia), MA (Wisconsin), PhD (Toronto), Professor and Chairman of English (1961, 1978).

ANDERSON, Ruby Olga, MEd (Alberta), Professor of Physical Education (1956, 1971).

ANDERSON, Wayne, BS (Minnesota) MPhil PhD (Yale), Assistant Professor of Biochemistry (1979, 1979).

ANDREW, William T., BSc (Alberta), MS (Utah State), PhD (Michigan State), Professor of Plant Science (1959, 1969).

ANDREWS, Eileen J., Administrative Professional Officer in Entomology (1979, 1979).

ANHOLT, LeRoy M., MD (Alberta), LMCC, Associate Professor and Assistant Dean of Medicine (1972, 1972).

ANTONELLI, Peter, BS, MSc, PhD (Syracuse) Professor of Mathematics (1970, 1980).

AOKI, Ted, BCom (British Columbia), BEd MEd (Alberta), PhD (Oregon), Professor and Chairman of Secondary Education (1978, 1978).

APEDAILE, Leonard P., BSc (McGill), PhD (Iowa State), Professor of Rural Economy (1966, 1977).

AQUILLA, Salavatore, BA (Simon Fraser), MLS (British Columbia), Professional Librarian (1977, 1977).

ARMOUR, Margaret A., BSc MSc (Edinburgh), PhD (Alberta), Faculty Service Officer in Chemistry (1979, 1979).

ARNOLD, Stephen H., BA Honors PhD (Oregon), Associate Professor of Comparative Literature (1970, 1975).

ARORA, Balraj K., BSc (Delhi), BDS (India), MS (Illinois), DMD (Saskatchewan), Professor of Dentistry and chairman, Division of Oral and Maxillofacial Surgery in Dentistry (1980, 1980).

ASCH, Michael I., BA (Chicago), PhD (Columbia), Associate Professor of Anthropology (1971, 1977).

ASSHETON-SMITH, Marilyn I., BSc (Alberta), Masters in Public Health (Minnesota), Associate Professor of Educational Foundations (1975, 1980).

ATKINSON, Thomas Page, BSc BEd (Alberta), PhD (Oregon), Professor of Elementary Education (1963, 1974).

AUNGER, Edmund A., BA (Wilfred Laurier), MSc (London), PhD (California), Professeur Adjoint à Faculté Saint-Jean (1976, 1976).

AUSTEN, David J., BSc MSc (Western Ontario), PhD (Manitoba), Faculty Service Officer in Physics (1977, 1977).

AYER, William Alfred, BSc PhD (New Brunswick), FCIC FRSC, Professor of Chemistry (1958, 1967).

AYLING, Ronald, BA (Nottingham), PhD (Bristol), Professor of English (1970, 1976).

AYOTTE, Denis G., BA (Alberta), Administrative Professional Officer in Housing and Food Services (1979, 1979).

BAADSGAARD, Halfdan, BSc (Minnesota), PhD (Federal Inst., Zurich), Professor of Geology (1957, 1966).

BACCHUS, M. Kazin, BSc MA PhD (London), MPH (California), Professor of Educational Foundations (1969, 1974).

BACHYNSKI, M. Gail, BA MSc (Alberta), Assistant Professor of Home Economics (1978, 1978).

BADIR, Doris, BSc (Manitoba), MSc (Syracuse), MSc (London School of Economics), Professor and Dean of Home Economics (1971, 1978).

BADIR, Magdy G., Lic. es Lettres (Ain-Chams), MA (Waterloo), PhD (Alberta), Associate Professor of Romance Languages (1977, 1979).

BAER, Hans P., PhD (Gottingen), Professor of Pharmacology (1969, 1976).

BAGGS, Ivan, BA(Ed) BSc (Memorial, Newfoundland), MSc PhD (Alberta), Assistant Professor of Mathematics (1974, 1980).

BAGNALL, Keith M., PhD MSc (Loughborough), Assistant Professor of Anatomy (1979, 1979).

BAI, David H., BA (Cornell), MA (Iowa), PhD (Alberta), Associate Professor of Anthropology (1971, 1977).

BAILEY, Arthur Wesley, BSA (British Columbia), MS PhD (Oregon State), Professor of Plant Science (1966, 1977).

BAIN, Bruce C., BA (Sir George Williams), MEd PhD (Alberta), Associate Professor of Educational Psychology (1972, 1976).

BAIN, Gordon Orville, BSc MD (Alberta), Professor and Chairman of Pathology (1952, 1967).

BAINE, David A., BA MA EdD (British Columbia), Associate Professor of Educational Psychology (1972, 1978).

BAIRD, Richard E. BA (Augustana), MA PhD (Illinois), Associate Professor of Political Science (1960, 1965).

BAKER, Charles G., DMD (Manitoba), MScD (Toronto), Professor and Chairman of Stomatology (1980, 1980).

BAKER, G. Ross, BA (McGill), MA PhD (Toronto), Lecturer in Health Services Administration (1980, 1980).

BAKER, Dennis M., BS (Fresno State), PhD (California), Associate Professor of Accounting (1973, 1973).

BAKER, William J., BA (St. John's), MA PhD (Fordham), Professor of Linguistics and the Centre for Advanced Study in Theoretical Psychology (1970, 1973).

BAKKER, Jaap J., BSc (Glasgow), DIC (Imperial College London), MSCE (Purdue), Professor of Civil Engineering (1959, 1976).

BALDERSON, James H., BEd MEd (British Columbia), PhD (Oregon), Associate Professor of Educational Administration (1975, 1978).

BALDWIN, R. George, BA (British Columbia), MA PhD (Toronto), Professor of English and Vice-President (Academic) (1951, 1979).

BALL, George Eugene, AB PhD (Cornell), MS (Alabama), Professor and Chairman of Entomology (1954, 1965).

BALL, Richard G., BSc PhD (Ontario), Faculty Service Officer in Chemistry (1980, 1980).

BALLAH, Allan John, MA (Alberta), Associate Professor of Romance Languages (1964, 1976).

BALLASH, Gary T., BSc (Alberta), Plant Project Engineer in Physical Plant (1967, 1968).

BALLIN, Theodore N., BS (Purdue), BA MA PhD (Washington), Assistant Professor of Classics (1976, 1976).

BANKS, Peter, RIA, B.A. (Alberta), Administrative Accountant-Systems in Comptroller's Office (1965, 1968).

BANKS, Roderick E., BA (Alberta), MLS (Western Ontario), RIA, Head of Administration in the University Library (1961, 1975).

BARAGAR, Francis Alvin, MSc (Manitoba), PhD (Brandeis), Associate Professor of Mathematics (1962, 1974).

BARBOUR, Douglas F., BA (Acadia), MA (Dalhousie), Associate Professor of English (1969, 1977).

BARCLAY, Harold, BA (Boston University), MA PhD (Cornell), Professor of Anthropology (1966, 1971).

BAREAU, Michel Louis, LesL. Dipl l'Et Sup (Sorbonne), Doct. de T. C. (Sorbonne), Associate Professor of Romance Languages (1966, 1973).

BARKER, Burke, LLB (Saskatchewan), Post Grad. Diploma in Criminology (Camb.), Professor of Law, Honorary Associate Professor of Psychiatry (1967, 1973).

BARNET, David, RBTC (Rose Bruford Training College of Speech and Drama), LRAM (Royal Academy of Music), ADB (Associate of Drama Board), Associate Professor of Drama (1974, 1979).

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DALWOOD, Ernest R., H., AMus (Alberta), Assistant Professor of Music (1975, 1975).

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NITECKI, Andre, MA (Chicago), Associate Professor of Library Science (1975, 1975).

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SMY, Peter Robert, BSc PhD (London), Professor of Electrical Engineering (1966, 1966).

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ZACKS, David J., MB ChB (Cape Town), DMRD (Edinburgh), FFR, Associate Clinical Professor in Radiology (1974, 1979).

ZETTER, Gerald R., MD (Alberta), Clinical Lecturer in Community Medicine (1961, 1978).

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NEWTON, Robert, President Emeritus (1919, 1950).

AKSEL, Rustem, Dip. Ing. Agronome, Doctor of Agriculture (Ankara), Professor Emeritus of Genetics (1966, 1976).

AFFLECK, Muriel Adeline, BEd MEd (Alberta), EdD (Colorado), Professor Emeritus of Elementary Education (1949, 1977).

ANDERSON, Arthur J., BSc (Alberta), MS PhD (Washington), Professor Emeritus of Pharmacy and Pharmaceutical Sciences (1949, 1979).

ARCHER, Violet, BMus (McGill), BMus MMus (Yale), DMus (McGill), Professor Emeritus of Music (1962, 1978).

BAKER, Harold S., LAB (Royal Schools), BA (Toronto), BA (Alberta), PhD (Columbia), Professor Emeritus of Secondary Education (1947, 1974).

BARRINGTON, James, BSc (Rangoon), University Professor and Professor Emeritus of History (1966, 1977).

BELL, James Baird., BA BEd (Saskatchewan), MEd (Alberta), EdD (Oregon), Professor Emeritus of Secondary Education (1966, 1979).

BENTLEY, C. Fred, BSc MSc (Alberta), PhD (Minnesota), Professor Emeritus of Soil Science (1946, 1979).

BERRY, Gerald L., BA MA BEd (Alberta), EdD (Colorado), Professor Emeritus of Secondary Education (1961, 1978).

BIGG, Walter Lionel, BSc (Alberta), Professor Emeritus of Civil Engineering (1957, 1973).

BLACKMORE, Robert Valentine, DDS (Alberta) PhD (Rochester), Professor Emeritus of Oral Biology (1948, 1978).

BLENCH, Thomas, BSc (Glasgow), DSc (Alberta), Professor Emeritus of Civil Engineering (1948, 1971).

BOWKER, Wilbur Fee, BA LLB (Alberta), LLM (Minnesota), Professor Emeritus of Law (1945, 1975).

BRODIE, Harold Johnston, MSc (Manitoba), PhD (Michigan), Professor Emeritus of Botany (1957, 1971).

CAMERON, Donald R., BA MEd (Alberta), EdD (Syracuse), Professor Emeritus of Educational Psychology (1962, 1974).

CARD, Brigham Young, BSc BEd (Alberta), PhD (Stanford), Professor Emeritus of Educational Foundations (1945, 1979).

CHAMBERS, Juanita, BA (McGill), MA PhD (Montreal), Professor Emeritus of Educational Psychology (1967, 1978).

CLANDININ, Donald Robert, MSA (British Columbia), PhD (Wisconsin), Professor Emeritus of Poultry Nutrition (1938, 1979).

CLARKE, Stanley C. T., BA MA MEd (Alberta), EdD (Stanford), Professor Emeritus of Educational Psychology (1950, 1977).

CLEGG, Lawrence F., BSc (Toronto), PhD DSc DIC (London), FIBiol FIFST PAg, Professor Emeritus of Food Science (1958, 1978).

COLLIER, Herbert Bruce, MA PhD (Toronto), FRCS, Professor Emeritus of Pathology (1949, 1971).

CORMACK, Robert George Hall, MA PhD (Toronto), FRSC, Professor Emeritus of Botany (1936, 1969).

CORNS, William G., BSc MSc (Alberta), PhD (Toronto), Professor Emeritus of Plant Science (1946, 1979).

COUTTS, Herbert T., BA (Toronto), MA LLD (Alberta), PhD (Minnesota), LLD (Memorial), Professor Emeritus of Education (1946, 1972).

DAVY, Grant R., BA (Western Ontario), MA PhD (Fletcher), Professor Emeritus of Political Science (1951, 1979).

DOWN, Edith Emily, BA BSc (Seattle), MA (British Columbia), PhD (Cornell), Professor Emeritus of Secondary Education (1966, 1977).

ELDER, Andrew T., BA (Alberta), MA PhD (Toronto), Professor Emeritus of English (1950, 1975).

EMPEY, Elizabeth Louise, BSc (Alberta), MNS PhD (Cornell), Professor Emeritus of Home Economics (1959, 1978).

ERIKSSON, Arthur William Emanuel, BSc (Alberta), MSc (Washington), Professor Emeritus of Physical Education (1945, 1974).

FAUCHER, Manoel, Len Droit (Paris), MA (California), Professor Emeritus of Romance Languages (1947, 1979).

FAULDS, Alexander G., MCSP DipTP (London), Professor Emeritus of Physical Therapy (1958, 1977).

FISHER, Olive Margaret, MA (Stanford), PhD (Chicago), LLD (Alberta), Professor Emeritus of Education (1945, 1950).

FOLINSBEE, Robert E., BSc (Alberta), MA PhD (Minnesota), FRSC, Professor Emeritus of Geology (1946, 1978).

FOSTVEDT, Thorleif, BSc (Alberta), MSc (Chicago), Professor Emeritus of Mathematics (1945, 1978).

FRASER, Sperry David, DDS (Alberta), FACD, Professor Emeritus of Prosthetic Dentistry (1939, 1962).

GAIN, Edward A., BA MD (Alberta), FACA, Professor Emeritus of Anaesthesia (1949, 1978).

GILLES, John William, MA MEd (Alberta), EdD (Stanford), Professor Emeritus of Educational Psychology, Director of Summer Session and Evening Credit Program (Retired) (1945, 1969).

GLYDE, Henry George, ARCA (London), RCA, Professor Emeritus of Fine Arts (1935, 1966).

GREENE, Edward Joseph Hollingsworth, MA (Alberta), DU (Paris), Professor Emeritus of Romance Languages (1938, 1978).

HAMILTON, William Scott, DDS (Toronto), FACD FDSRCS (England), Professor Emeritus of Oral Surgery (1925, 1958).

HAMPSON, Cyril G., BA PhD (Alberta), Professor Emeritus of Secondary Education (1952, 1979).

HANSON, Eric J., BA (Queen's), MA (Alberta), PhD (Clark), FRSC FRSH, Professor Emeritus of Economics (1946, 1974).

HARDY, Robert Macdonald, BSc DSc (Manitoba), MSc (McGill), FRCS FEIC, Professor Emeritus of Engineering (1930, 1971).

HASTIE, Evangeline Alberta, BA (Toronto), Professor Emeritus of Physical Education (1945, 1958).

HENRY, Arthur Wellesley Campbell, MSA (Saskatchewan), PhD (Minnesota), Professor Emeritus of Plant Science (1927, 1962).

HERMANSEN, Gustav, MA PhD (Copenhagen), Professor Emeritus of Classics (1965, 1974).

HUSTON, Mervyn J., BSc MSc (Alberta), PhD (Washington), Professor Emeritus of Pharmacy and Pharmaceutical Sciences (1940, 1978).

JACKA, Reginald Charles, BSc (Alberta), MSc (Chicago), Professor Emeritus of Mathematics (1945, 1977).

JOHNS, Walter H., BA LLD (Western Ontario), PhD (Cornell), D es L (Laval), LLD (Saskatchewan), LLD (Waterloo Lutheran), Professor Emeritus of Classics (1938, 1973).

JOHNSON, Leroy Peter V., BSc MSc (Alberta), PhD (Washington State), Professor Emeritus of Genetics (1948, 1970).

JONES, John Thomas, BA MA (Alberta), BA MA (Oxon.), Professor Emeritus of English (1922, 1964).

KEEPING, Ernest S., BSc (London), DIC (Imperial College, London), ARCS, Professor Emeritus of Mathematics (1929, 1965).

KLAWE, Janusz Josef, Dip. Com. (Grenoble), MA (Glasgow), Professor Emeritus of Geography (1963, 1976).

KLAWE, Kathleen W., MA (Glasgow), Professor Emeritus of Economics (1964, 1979).

KORDA, Benedikt, MSc (Charles), MA (Prague Polytechnical School), DSc (Prague School of Economics), Professor Emeritus of Economics (1968, 1979).

KOWALEWSKI, Konstant Piott, MPhil (Warsaw), DPhil MD (Brussels) FRCP(C) Professor Emeritus of Surgery (1955, 1978).

KRUPICKA, Jiri, MA RNDr (Prague) Professor Emeritus of Geology (1971, 1978).

LEITCH, Douglas Burrows, MC BA MD (Toronto), FRCP(C), Professor Emeritus of Paediatrics (1923, 1957).

LESINS, Karlis Adolfs, BAgr (Latvia), LicAgr (Sweden), DSc (Alberta), Professor Emeritus of Genetics (1962, 1971).

LILGE, Ewald O., BSc MSc (Alberta), Professor Emeritus of Mining and Metallurgy (1963, 1971).

LONGLEY, Richmond Wilberforce, BSc (Acadia), AM EdM (Harvard), MA (Toronto), Professor Emeritus of Geography (1959, 1973).

LORD, Goldwin Smith, MA LLD (Mt. Allison), Professor Emeritus of Education (1945, 1950).

LOVE, Harold C., BS MS (Kansas State), PhD (Iowa State), Professor Emeritus of Rural Economy (1962, 1976).

LOWIG, Henry F. J., DRN Venia Docendi (Prague), DSc (Tasmania), Professor Emeritus of Mathematics (1957, 1970).

MacGREGOR, Hugh Alton, BSc (Alberta), MSc (Cornell), EdD (Oregon State College), Professor Emeritus of Education (1945, 1959).

MacGREGOR, John Watt, BA MD (Alberta), Professor Emeritus of Pathology (1932, 1970).

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MARDIROS, Anthony M., MA (Melbourne), MLitt (Cantab.), Professor Emeritus of Philosophy (1946, 1977).

McCALLA, Arthur Gilbert, MSc (Alberta), PhD (California), FAIC FRSC, Professor Emeritus of Plant Biochemistry (1940, 1971).

McCLURE, Ruth E., BSc (Alberta), MPH (Pittsburgh), Professor Emeritus of Nursing (1956, 1976).

McELROY, Laird W., BSc MSc (Alberta), PhD (California), Professor Emeritus of Animal Science (1943, 1973).

McMURCHY, Kenneth A., BA (Saskatchewan), DDS (Alberta), Professor Emeritus of Oral Biology (1949, 1978).

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PATCHING, Thomas H., BSc (Alberta) Professor Emeritus of Mineral Engineering (1947, 1980).

PHIBBS, Edgar, MA (Cantab), Professor Emeritus of Mathematics (1947, 1973).

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RENNER, Ruth Olive Ann, MSc (Alberta) PhD (Cornell) Professor Emeritus of Home Economics (1960, 1980).

ROSTRUP, Olav, Professor Emeritus of Surgery (1963, 1978).

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RYAN, Aylmer Arthur, MA (Alberta), LLD (Sir George Williams), Professor Emeritus of English (1940, 1977).

SALT, Walter Raymond, MSc (Alberta), Professor Emeritus of Anatomy (1949, 1971).

SANDIN, Reuben Benjamin, MA (Alberta), PhD (Chicago), FRSC, Professor Emeritus of Chemistry (1922, 1964).

SCHMIDT, Wilfred H. O., BA (S. Africa), DrPhil (Leipzig), Professor Emeritus of Educational Psychology (1966, 1978).

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SMITH, Alexander, BA LLB (Alberta), LLM JSD (Stanford), Professor Emeritus of Law (1947, 1973).

SMITH, Douglas E., BA MA (Queen's), PhD (Harvard), Professor Emeritus of Psychology (1937, 1975).

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STEWART, Wilson N., BA (Wisconsin) MS (Illinois) PhD (Wisconsin), Profession Emeritus of Botany (1966, 1978).

THOMAS, Lewis Gwynne, MA (Alberta), PhD (Harvard), Professor Emeritus of History (1938, 1974).

THOMSON, Keith H., BA MA BEd (Alberta), EdD (California), Professor Emeritus of Educational Foundations (1947, 1973).

THOMSON, Robert K. C., BSc MD (Alberta), FACP, Professor Emeritus of Medicine (1939, 1978).

THORNTON, Harold Ray, BSc (Alberta), PhD (Wisconsin), Professor Emeritus of Dairy Science (1929, 1958).

TOOGOOD, John A., BSc (Alberta), PhD (Minnesota), Professor Emeritus of Soil Science (1948, 1978).

TUBA, Jules, MSc (Saskatchewan), PhD (Toronto), Professor Emeritus of Dentistry (1942, 1971).

TYNDALL, D. Gordon, MA (Toronto), PhD (California), Professor Emeritus of Finance and Management Science (1967, 1979).

VAN VLIET, Maurice L., BSc MSc (Oregon), EdD (California), Professor Emeritus of Physical Education (1945, 1978).

VANT, John Ross, BA (Saskatchewan), MD (Manitoba), FACS FACOG FRCS(C) FRCOG, Professor Emeritus of Obstetrics and Gynaecology (1932, 1962).

WALKER, Bernal E., BA MA (Alberta), Dip (Sorbonne), PhD (Stanford), Professor Emeritus of Educational Foundations (1947, 1973).

WALKER, George William Rutherford, MA (Saskatchewan), PhD (McGill), Professor Emeritus of Genetics (1963, 1978).

WILSON, Donald R., BA (Oxford), MD CM (McGill), FRCP(C), FACP, Professor Emeritus of Medicine (1947, 1978).

WATSON, Sheila M., BA MA (British Columbia), PhD (Toronto), Professor Emeritus of English (1961, 1975).

WHIDDEN, John MacLean, BCom (Alberta), Bursar (Retired) (1947, 1968).

WHITE, Alison Genevieve, BEd (Eastern Illinois), MA (Ohio), MA (Bread Loaf), PhD (University of Iowa), Professor Emeritus of English (1955, 1974).

WOOD, Franklin W., BSc MSc (Alberta), Professor Emeritus of Food Science (1946, 1973).

YONGE, Keith A., MD CM (McGill), DPM (London), FRCP(C), FACP, FRCP, Professor Emeritus of Psychiatry (1957, 1975).

ALLAN, S. Pamela, BN (McGill), Cert in Administration (Minnesota), Assistant Professor of Nursing (1981, 1981).

BERKOWITZ, N., BSc PhD, Associate Academic Staff member in the Department of Mineral Engineering (1977, 1977).

BOTTERILL, Darlene, MHSA (Alberta), Assistant Professor of Nursing (1981, 1981).

CAMPBELL, J. D., PhD (McGill) Associate Academic Staff member in the Department of Forest Science (1978, 1978).

COEN, Gerald Marvin, BSc MSc (Alberta), PhD (Cornell), Assistant Professor of Soil Science (1971, 1971).

du PLESSIS, Morne P., National Tech Cert (Witwatersrand Tech. College), BSc (Potchefstroom), BSc MSc (Natal), PhD (Alberta), Professor of Mechanical Engineering. (1980, 1980).

GEYER, Barbara, BScN (Alberta), Assistant Professor of Nursing (1981, 1981).

GOYER, Guy G., BA BSc MSc PhD (Montreal), Associate Academic Staff member in the Department of Geography (1974, 1974).

HELM, J., BSc MSc (Washington State), PhD (Oregon State), Associate Academic Staff member in the Department of Plant Science (1973, 1974).

JOHNSON, Margaret, MHSA (Alberta), Assistant Professor of Nursing (1981, 1981).

LOWRIE, Robert J., BSc MSc (Auckland), PhD (Massey), Honorary Professor in Food Science (1981, 1981).

MILLS, Karen, MHSA (Alberta), Associate Professor of Nursing (1980, 1980).

PETTAPIECE, William Wayne, BSc MSc (Manitoba), PhD (Alberta), Assistant Professor of Soil Science (1971, 1971).

ROEMER, Cheryl, MEd (Alberta), Assistant Professor of Nursing (1981, 1981).

SMITH, Donna, MEd (Alberta), Assistant Professor of Nursing (1981, 1981).

YEH, Francis C., BSc PhD (Calgary), Associate Professor of Forest Science (1980, 1980).

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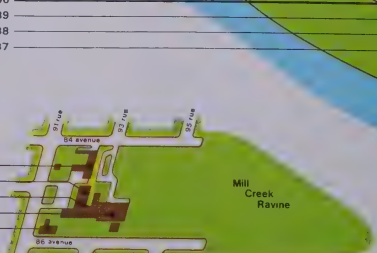

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35 Veterans' Nursing Home
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31 Power Plant (South)
31a University Services Building
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Special Sessions

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Special Sessions

Students are advised to pay particular note to the following deadlines.

Admission for Spring Session—March 2

Admission for Summer Session—April 1

Admission for On-Campus Evening Degree Credit Courses and
Evening Credit Program (Off-Campus) Courses—July 2

all undergraduate programs except the following, which have earlier deadlines: M.D. (November 3, 1980); D.D.S. and Dental Hygiene (February 2, 1981); LL.B. (February 27, 1981); B.F.A. Drama (April 1, 1981); B.F.A. Art and Design and Rehabilitation Medicine (May 1, 1981); B.Sc. in Nursing Basic and Post-basic programs (May 15, 1981); B.Ed. and B.Ed.A.D. (June 1, 1981); B.Sc. in Engineering applicants who have previously attended post-secondary institutions (June 15, 1981). (See Academic Schedule, Section 261.4.2)

(Admission is separate and distinct from Registration. Before a student who has never attended The University of Alberta can register in a course, he must first apply for Admission to a program of studies in a particular Faculty. This involves completing an Application for Admission form which must be submitted to the University along with transcripts of academic record. Once accepted, the student may then register.)

Registration and Changes of Registration for Spring Session—April 1

Registration and Changes of Registration for Summer Session—April 30

Pre-registration for students in the Winter Session On-Campus Evening Degree Credit Courses—Faculty of Education—June 1; all other faculties—August 12.

Registration for the Evening Credit Program (Off-Campus)—Students registering in the Evening Credit Program (Off-Campus) may pre-register at any time up to and including the first class meeting. However, those students who have not registered by August 28 are advised to delay their registration to the first class meeting.

Other deadlines are set out in the Academic Schedule (See §261).

Please Note

(1) Each student is responsible for the completeness and accuracy of his registration. Please read the Calendar carefully and, if you are in doubt about the regulations pertaining to your program, consult the appropriate University official.

(2) The calendar sets forth the intention of the University, at the time of its publication, with respect to all matters contained therein. The University reserves the right at any time to deviate from what appears in the calendar, either in order to serve the best interests of the University, or because of circumstances or occurrences beyond the University's reasonable control. The University expressly denies responsibility or liability to any person or persons who may suffer loss or who may be otherwise adversely affected by such change.

(3) **STUDENTS IN THE FACULTY OF EDUCATION** should make special note of the following:

Wherever possible, Education students are encouraged to register for Spring and Summer courses in-person in the Student Service Office—Room 833 Education South. In-person registration allows for a careful check of program requirements and reveals immediately whether selected courses are available.

Admissions to the B.Ed. and B.Ed A/D programs are restricted to September and January only. Applicants who are seeking admission to the Faculty of Education to satisfy the Alberta Department of Education certification requirements will be accepted provided the Application for Admission is received by March 2 (Spring Session) or April 1 (Summer Session).

Course Load

(a) Students in undergraduate programs are restricted to 3 credits in each term of the Spring and Summer session. Students with an established G.P.A. of 7.5 on the last 30 credits of work completed as a student in the Faculty of Education may do up to 6 credits each term of the Spring or Summer to a maximum of 18 credits for the combined Spring and Summer sessions.

(b) Diploma students are restricted to 3 credits each term of the Spring and Summer session except by *written* permission of their respective Department Chairman. Attach your written consent to your registration form.

(c) Special and Visiting students are restricted to 3 credits each term of the Spring or Summer session, regardless of academic average.

[Students who submit registration forms which do not conform to these regulations will have the extra courses deleted before the registration is processed.]

Students registered in the Faculty of Education may advance register in on-campus Evening Credit courses until *June 1*. After that date students must register during the in-person registration period (in accordance with the published schedule).

WARNING:

Each student is responsible for the accuracy of his/her own program. You must insure that any course(s) taken in Spring/Summer does not interfere with your professional or senior terms. If you take inappropriate or out of sequence courses you may lose credit for those courses. If you have any questions be sure to check with your record clerk in Room 833 Ed South.

(4) Examinations

Supplemental Examination privileges are *NOT* extended to Spring and Summer courses.

Regulations regarding deferred examinations for Spring and Summer Session courses can be found under §261.11.5.

(5) Further inquiries should be directed as follows:

On academic matters—The Dean of the appropriate faculty.

On admissions, examinations, registration, records, transcripts, Convocation—The Office of the Registrar.

On change of faculty, interest and aptitude tests, personal problems, unsatisfactory standing, vocational planning, withdrawal from University—P. C. Sartoris, Director, Student Counselling Services.

On financial assistance—L. Henderson, Administrator of Student Awards.

On University residences and other housing—G. Brown, Director, Housing and Food Services.

On textbooks—The University of Alberta Bookstore.

(6) The office hours of The University are from 8:30 a.m. to 12 noon and from 1:00 p.m. to 4:30 p.m. Monday to Friday (except holidays); in May, June, July, and August the office hours are from 8:00 to 11:30 a.m. and 12:30 to 4:00 p.m. Telephone number: 432-3111 (area code 403).

(7) The summer hours for the offices of the Registrar and the Comptroller, May through August are from 8:00 a.m. to 12 noon and 1:00 p.m. to 4:00 p.m. Fees may be paid at the Office of the Comptroller from 8:30 a.m. to 4:00 p.m.; the Cashier will be open from 8:30 a.m. to 3:30 p.m.

(8) The Bookstore hours are from 9:00 a.m. to 5:00 p.m. Monday to Friday (except holidays) and 10:00 a.m. to 1:00 p.m. Saturdays (except those within long weekends), for the months of September through April, 8:30 a.m. to 4:30 p.m. Monday to Friday for the May through August period. Telephone number—432-4215.

(9) When ordering books by mail from The University of Alberta Bookstore please state the course name, course number, section number, and the session (Spring, Summer, or Winter). Further information on textbooks is provided in § 261.12.8.

(10) Students age 65 or over are eligible for remission of fees. Further information is provided in § 261.10.3.

(11) Students registering in the Evening Credit Program (Off-Campus) are reminded to indicate on their registration form both the section number of the course and the location in which it is being offered.

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1981

January

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August

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September

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Special Sessions

261 UNIVERSITY REGULATIONS

261.1 General Information

Courses in the Spring Session are held on The University of Alberta campus during the period May 4-June 12. Similarly, Summer Session courses are held on-campus during the period July 6-August 14. In a few instances courses are held at off-campus centres.

Courses in the Evening Credit Program (Off-Campus) are offered only at centres off-campus. The courses primarily are designed to meet the needs of students who are working towards the B.Ed., B.A., or B.Sc. degrees.

The Evening Credit Program courses formerly offered in Edmonton have been integrated into the regular Winter Session offerings of the Faculties and Schools as On-Campus Evening Degree Credit Courses. Normally students who took Evening Credit Program courses in the past will now be part-time students.

Since some courses are subject to registration quotas, students are advised to register as early as possible.

261.2 Academic Schedule—Spring Session

261.2.1 MARCH, 1981

Monday, 2

■ Last day for receiving applications for admission to the 1981 Spring Session from students who have never attended The University of Alberta.

261.2.2 APRIL, 1981

Wednesday, 1

■ Last day for registration in Spring Session courses.

Friday, 17

Good Friday, University buildings closed.

261.2.3 MAY, 1981

Monday, 4

7:30 a.m. Spring Session classes begin in First Term and full-session courses.

Saturday, 9

Classes continue on this day in lieu of those cancelled because of the Victoria Day holiday.

Friday, 15

■ Last day for withdrawal from First Term courses.

Monday, 18

Victoria Day, University Buildings closed.

Friday, 22

Final examinations in First Term courses; classes continue in full-session courses.

Monday, 25

7:30 a.m. Second Term Spring Session classes begin.

Friday, 29

■ Last day for withdrawal from full-term courses.

261.2.4 JUNE, 1981

Friday, 5

■ Last day for withdrawal from Second Term courses.

Friday, 12

Spring Session final examinations in full-session and Second Term courses.

261.3 Academic Schedule—Summer Session

261.3.1 APRIL, 1981

Wednesday, 1

■ Last day for receiving applications for admission to the 1981 Summer Session from students who have never attended The University of Alberta.

Thursday, 30

■ Last day for registration in Summer Session courses.

261.3.3 JULY, 1981

Wednesday, 1

Statutory Holiday; University buildings closed.

Thursday, 2

■ Last day for receiving applications for admission in the 1981-82 Winter Session to all undergraduate programs except the following, which have earlier deadlines: M.D. (November 3, 1980); D.D.S. and Dental Hygiene (February 2, 1981); LL.B. (February 27, 1981); B.F.A. Drama (April 1, 1981); B.F.A. Art and Design and Rehabilitation Medicine (May 1, 1981); B.Sc. in Nursing Basic and Post-basic programs (May 15, 1981); B.Ed. and B.Ed.A.D. (June 1, 1981); B.Sc. in Engineering applicants who have previously attended post-secondary institutions (June 15, 1981).

Monday, 6

7:30 a.m. Summer Session classes begin in First Term and full-session courses.

Friday, 17

■ Last day for withdrawal from First Term courses.

Friday, 24

Final examinations in First Term courses; classes continue in full-session courses.

Monday, 27

7:30 a.m. Second Term Summer Session classes begin.

Friday, 31

■ Last day for withdrawal from full-term courses.

261.3.4 AUGUST, 1981

Monday, 3

Heritage Day; University buildings closed.

Friday, 7

■ Last day for withdrawal from Second Term courses.

Saturday, 8

Classes continue on this day in lieu of those cancelled because of the Heritage Day holiday.

Friday, 14

Summer Session final examinations in full-session and Second Term courses.

261.4 Academic Schedule—On-Campus Evening Degree Credit Courses and Evening Credit Program (Off-Campus)

261.4.1 JUNE, 1981

Monday, 1

■ Last day for students in the Faculty of Education to advance register for On-Campus Evening Degree Credit Courses. Education students not registered by this date must register during the in-person registration period. (in accordance with the published schedule)

261.4.2 JULY, 1981

Thursday, 2

■ Last day for receiving applications for admission in the 1981-82 Winter Session to all undergraduate programs except the following, which have earlier deadlines: M.D. (November 3, 1980); D.D.S. and Dental Hygiene (February 2, 1981); LL.B. (February 27, 1981); B.F.A. Drama (April 1, 1981); B.F.A. Art and Design and Rehabilitation Medicine (May 1, 1981); B.Sc. in Nursing Basic and Post-basic programs (May 15, 1981); B.Ed. and B.Ed.A.D. (June 1, 1981); B.Sc. in Engineering applicants who have previously attended post-secondary institutions (June 15, 1981).

Friday, 3

■ Last day for receiving applications for regular supplemental and deferred examinations granted by faculties.

261.4.3 AUGUST, 1981

Wednesday, 12

■ Last day for advance registration in on-campus late afternoon and evening courses, except in B.Ed. program (See June 1). New students must have applied for admission by July 2, 1981.

Friday, 14

■ Last day for submitting re-enrolment forms to the Faculty of Arts by students previously registered in another faculty and wishing to transfer in September.

261.4.4 SEPTEMBER, 1981

Wednesday, 2, to Friday, 4

In person registration (in accordance with a published schedule) of all on-campus students who have not registered earlier.

Monday, 7

Labor Day; University buildings closed.

Tuesday, 8, to Monday, 14

In-person registration (at first scheduled class) for most admitted students in the Evening Credit Program (Off-Campus).

Tuesday, 8

Evening Credit Program (Off-Campus) and On-Campus Evening Degree Credit classes begin.

Wednesday, 30

■ Last day for payment of undergraduate fees without penalty.

261.4.5 OCTOBER, 1981

Monday, 12

Thanksgiving Day; University buildings closed.

Monday, 19

■ Last day for dropping First Term courses or changing from "credit" to "audit" or "audit" to "credit" in First Term courses in the Faculty of Graduate Studies and Research.

Monday, 19, to Friday, 23

Mid-term Test Week. Evening Credit Program (Off-Campus) classes will meet as usual during this week.

261.4.6 NOVEMBER, 1981

Monday, 2

■ Last day for receiving applications for admission for the Faculty of Education for second term courses.

Wednesday, 11

Remembrance Day; University buildings closed.

Thursday, 12

■ Last day for withdrawing from First Term courses, or changing from "credit" to "audit" by students in the Faculties of Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculte St.-Jean and Science.

261.4.7 DECEMBER, 1981

Tuesday, 1

■ Last day for receiving applications for admission to Second Term courses from students who have never attended The University of Alberta except in the Faculty of Education (see Nov. 2).

Tuesday, 15

■ Last day to apply for degrees in Arts to be conferred at Spring Convocation.

★ *Mid-Session or Final Examinations (if any) for all On-Campus Evening Degree Credit Courses will be held during the regular instruction period.*

★ *Mid-Session or Final Examinations (if any) for all Evening Credit Program (Off-Campus) courses will be held during the last regular instruction period.*

261.4.8 JANUARY, 1982

Monday, 4

Second Term lectures begin in On-Campus Evening Degree Credit courses.

Monday, 4, to Friday, 8

In-person registration (at first scheduled class) for most admitted students in the Evening Credit Program (Off-Campus).

Monday, 11

■ Last day for in-person registration and change of registration for on-campus students registering in Second Term courses.

Friday, 15

■ Last day for payment without penalty of second instalment fees and for students attending only in the Second Term. (See Regulations § 261.9 and § 261.10).

261.4.9 FEBRUARY, 1982

Monday, 1

■ Last day for application for degrees in Business Administration and Commerce, Education, Home Economics, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, and Science to be conferred at Spring Convocation.

Friday, 12

■ Last day for withdrawing from full-session courses or for changing from "credit" to "audit" in full-session courses by students in the following Faculties: Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Library Science, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculte St. Jean, and Science.

Monday, 15

■ Last day for dropping Second Term courses or full-session courses, or changing from "credit" to "audit" or "audit" to "credit" in Second Term or full-session courses in the Faculty of Graduate Studies and Research.

Monday, 15 to Friday, 19

Mid Term Test Week. Evening Credit Program (off-campus) classes will meet as usual during this week.

Monday, 22 to Sunday, 28

Second Term Reading Week.

261.4.10 MARCH, 1982

Monday, 1

■ Last day for withdrawal from Second Term courses, or for changing from "credit" to "audit" in Second Term courses, by students in the following Faculties: Agriculture and Forestry, Arts, Business Administration and Commerce, Education, Engineering, Home Economics, Medicine, Nursing, Pharmacy and Pharmaceutical Sciences, Physical Education and Recreation, Rehabilitation Medicine, Faculte St. Jean, and Science.

Wednesday, 17

■ Last day for applications for supplemental examinations to be written in April for graduating students.

261.4.11 APRIL, 1982

Friday, 9

Good Friday, University buildings closed.

★ *Examinations in Evening Credit Program (Off-Campus) courses will be held during the last regular instruction period.*

★ *Final examinations in On-Campus Evening Degree Credit courses will be held during the last regular instruction period. For those classes meeting on Fridays, the last regular instruction period will be March 28.*

261.4.12 MAY, 1982

Wednesday, 12

Notice of intention regarding attendance at Spring Convocation must be given by 12 noon.

Monday, 31, to June, 3

Convocation (Parts I to IV)

261.4.13 JUNE, 1982

Tuesday, 1

■ Last day for students in the Faculty of Education to advance register for on-campus evening courses. Education students not registered by this date must register at the in-person registration (in accordance with a published schedule).

Tuesday, 15

■ Last day for students who have been required to withdraw to notify their Dean that they wish to seek readmission.

261.5 Classification of Students

261.5.1 UNDERGRADUATE AND GRADUATE STUDENTS

(1) *Undergraduate students* are those who are registered in a faculty other than the Faculty of Graduate Studies and Research. These students fall into two categories:

(i) Full-time students—those who are enrolled in the equivalent of three or more half courses in a term.

(ii) Part-time students—those who are enrolled in the equivalent of less than three half courses in a term.

(2) *Graduate students* are those who have been admitted to the Faculty of Graduate Studies and Research. These students are designated as "Full-time" or "Part-time" by the Faculty of Graduate Studies and Research according to their workload of courses and/or research. A more detailed classification of graduate students will be found in § 202.1 of the Graduate Studies and Research Calendar.

261.5.2 INTRAMURAL AND EXTRAMURAL STUDENTS

(1) *Intramural Students* are those who are attending The University of Alberta at Edmonton or any of its off-campus centres.

(2) *Extramural Students* are those who, although not attending the University or any of its off-campus centers, are permitted to take one or more courses by correspondence or directed study. This privilege may be granted by a faculty in special circumstances.

261.5.3 CLASSIFICATION OF UNDERGRADUATE STUDENTS

(1) *Degree, Diploma, or Certificate Program Students* are those who are registered in a program leading to a degree, diploma, or certificate normally granted by The University of Alberta.

(2) *Special Students* are those who have been permitted to register in one or more courses, but not officially for credit towards a degree or diploma at this or any other institution.

(3) *Visiting Students* are bona fide students of other universities or colleges, who have been permitted to take one or more courses for transfer of credit to their own institutions which have agreed in advance to such an arrangement. In the Faculty of Graduate Studies and Research visiting students are called "Exchange Students".

(4) *Probationary Students* are students who have been admitted (or permitted to continue) on a probationary basis, because their previous academic record is either deficient in some respect, below the standard ordinarily required, or difficult to assess. Normally, if such a student fails to meet the conditions stipulated within the time limit imposed, he will not be allowed to proceed further in his program.

(5) Auditors are not registered for credit but are taking one or more courses under the following conditions:

*(i) The individual must receive permission from the course instructor, the chairman of the department, and the dean of the faculty in which the course is offered.

(ii) Such permission shall not in itself be a guarantee of admission to the class. The final

decision shall weigh class size, impact on credit students, and other factors that the instructor, department or faculty establishes.

(iii) Courses audited in this manner will not be considered as meeting prerequisite, admission, or course requirements for any University degree program.

(iv) Individuals auditing courses shall limit their participation in the class to that deemed appropriate by the instructor.

*Since final permission to audit a course cannot be given until the number of students registered in the course for credit is known, students and others should not seek authority to register as auditors until the start of classes.

261.6 Admission

261.6.1 ADMISSION REQUIREMENTS

General Requirements: For admission a student must present five Alberta Grade XII subjects specified by the appropriate Faculty and have at least a 60.0% overall average on these five subjects and a mark of at least 50% in each. Students with a different educational background must present equivalent qualifications. For detailed information on particular Faculties, students should consult the University Regulations and Information Calendar.

Refusal of Admission: Notwithstanding anything in its regulations, The University of Alberta may, at its discretion, refuse admission to any applicant. Admission will normally be refused to an applicant who has had to write what the University considers an inordinate number of examinations to attain the nominal entrance requirements of the University.

261.6.2 ADMISSION PROCEDURES FOR NEW STUDENTS

Any person who wishes to register and who has never attended The University of Alberta before must seek admission by the deadline: March 3 for Spring Session, April 1 for Summer Session;for On-Campus Evening Degree Credit Courses and Evening Credit Program (Off-Campus) see Section 261.4.2. The procedure is outlined below.

Undergraduate students: Complete an Application for Admission form and return it with the $20.00 application fee to the Office of the Registrar. Arrange to have transcripts for *all* previous education sent by the appropriate offices to the Registrar.

Graduate students: Complete the Application for Admission to Graduate Studies form and return it with the $12.00 application fee to the Office of the Faculty of Graduate Studies and Research. Arrange to have two transcripts sent by each of the appropriate offices for *all* previous education to the Office of the Faculty.

Advanced Standing: Applicants for admission who have previously completed some university level work elsewhere may be admitted with advanced standing, which may shorten their program at The University of Alberta. Applicants whose previous university work was done by correspondence may be granted advanced standing under certain conditions but normally only with respect to the first year of their program.

Advanced Placement: Applicants who have taken the equivalent of university courses in some other manner may be given advanced placement, rather than advanced standing, which excuses them from taking the corresponding university courses, but requires them to substitute other courses in order to complete a program of normal weight at the University.

All applications for admission with advanced placement or advanced standing should be addressed to the Registrar well in advance of the deadlines. (See § § 261.2, 261.3 and 261.4.) Each application will be dealt with on its own merits. The University reserves the right to require applicants for advanced standing or advanced placement to write examinations at any level including that of matriculation.

The amount of advanced standing that may be granted is limited by the residence requirements of the University, which provide that a student proceeding towards a first degree will normally be required to attend at least one academic year and complete a full year's program.

Credit by Special Assessment: Some faculties have agreed to allow students to seek credit in certain specified courses without actually registering in and taking courses, if they can demonstrate an acceptable level of mastery of the course content. The procedures whereby a student seeks credit in a course by this non-traditional route is known as *Credit by Special Assessment.*

Faculties, in consultation with departments, will determine which, if any, of their course credits may be earned by special assessment, and the conditions that a student must satisfy in order to have his application approved.

The privilege of seeking credit in a course by special assessment is limited to students admitted to the University.

Students wishing to complete course credit(s) by this means are advised to report to their Faculty Office in order to be apprised of faculty regulations and deadlines for submission of applications.

261.6.3 ENGLISH LANGUAGE PROFICIENCY

General Requirements

Since the language of instruction at the University of Alberta is English, except for those courses offered in French by Faculte Saint-Jean, all applicants to faculties other than Faculte Saint-Jean must possess an adequate knowledge of written and of spoken English. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language as a prerequisite to admission. This demonstration may take any one of several forms:

1. successful completion of the equivalent of three years of full-time instruction in an English language secondary institution in Canada;

2. presentation of a successfully completed full-year or more of course work, including an introductory course in English, in an accredited post-secondary institution where English is the language of instruction and from which advance credit is normally allowed by the University of Alberta;

3. successful completion of the equivalent of three years of full-time instruction in a school/institution outside Canada where academic subjects are taught by "English Language" instructors, as accredited by the International Institute of Education (I.I.E.), or as recognized by the University of Alberta;

4. successful completion of the equivalent of three years of full-time instruction in a school in Canada in which the major language of instruction is other than English but where the level of English

proficiency required for graduation is equivalent to that in English language schools, as recognized by a provincial Department of Education;

Or

5. presentation of results of the Test of English as a Foreign Language (TOEFL) or its equivalent in other approved standard tests.

a. Applicants presenting a TOEFL score of 600 (or its equivalent in other approved standard tests) will be considered as having demonstrated English language proficiency.

b. Applicants presenting a TOEFL score of less than 600 but 550 or greater will usually be considered as having a minor deficiency. Subject to the requirements of the particular Faculties, such an applicant may be granted conditional admission into the University but will be required to successfully complete one or more remedial Faculty of Extension non-credit English language courses and may be required to register in less than a normal course load in his or her regular program until the English language deficiency has been corrected. The student will not be permitted to register in a further academic year until satisfactory command of the language of instruction has been demonstrated (as in (a) above).

c. An applicant presenting a TOEFL score of less than 550 will be considered as having a major deficiency in the language of instruction and will not be admitted into the University of Alberta until proficiency can be demonstrated.

Specific Faculty Requirements

Some faculties may require greater strength in English communicative skills than is required in other programs. These additional requirements are detailed in the Faculty Regulations Section of the Faculty Calendar. In applying to such faculties the applicant must satisfy the additional language requirements as well as meet the general requirements outlined above. Students seeking entry as non-matriculated adults should see the special English proficiency requirements detailed in the Faculty Regulations sections of the Calendar.

Further information is available from the A.P.E.L. Division, Office of the Registrar, Room 128 Administration Building. TOEFL application forms are available from the Examinations and Timetabling Division, Office of the Registrar, Room 123 Administration Building; or by writing direct to Educational Testing Service, Princeton, New Jersey, U.S.A., 08540.

261.6.4 ADMISSION PROCEDURES FOR CONTINUING AND FORMER STUDENTS

A student who has previously registered and is continuing in the same program without interruption is not required to re-apply for admission to subsequent years unless he has been advised that he may not continue in the program.

A student who wishes to register either in another program within the same faculty or in a program offered by another faculty must complete an Application for Re-enrolment form. This may be obtained from the Registrar and the application must be approved by the Dean who is responsible for the program the student seeks to enter.

A student who has interrupted his program for one or more Winter Sessions, must also complete an Application for Re-enrolment form which will be handled in the same manner as that outlined in the paragraph above.

If a student has interrupted his studies because he was required to withdraw, he should ensure that his intention to seek re-admission is communicated to the appropriate Dean by June 15. This date is set to ensure that adequate counselling may be given.

261.7 Registration

261.7.1 RESPONSIBILITY FOR REGISTRATION

Each student is responsible for the completeness and accuracy of his registration. He is also responsible for any adjustments of registration made necessary by the results of supplemental examinations. Particular care should be exercised with regard to prerequisite courses.

261.7.2 REGISTRATION PROCEDURE

Persons who have not attended The University of Alberta before must first seek admission as outlined in § 261.6.

Registration forms must be completed and returned to the appropriate Faculty office by the deadlines specified in the Academic Schedule. The forms for each session are different; a student who wishes to attend more than one session must complete more than one set of forms.

Students registering in the Faculty of Graduate Studies and Research will be charged a $10.00 registration fee for each session attended. This fee will be assessed at the same time as the instructional fees.

Students whose registrations have been approved will receive from the Registrar a statement of fees.

Each student will be required to confirm his Spring and Summer registration by the payment of fees before the session begins (§ 261.8.1).

261.7.3 LIMITATIONS ON REGISTRATION

One full course or equivalent per session is regarded as the normal load for a student in the Spring Session, Summer Session, On-Campus Evening Degree Credit Courses or Evening Credit Program (Off-Campus). However, a student with a good academic record may be permitted by his Faculty to register in a maximum of two full courses or the equivalent. Decisions with respect to the quality of a student's academic record normally will be based on the equivalent of a year's university work completed previously. Under no circumstances will a student be permitted to register in more than the equivalent of two full courses in a Session, or one full course if he attends only one term of a Session.

There are, however, certain designated courses which may not be taken concurrently with other courses and this is indicated immediately after the course number in the Schedule of Courses and Timetable.

261.7.4 COURSE SELECTION

A Schedule of Courses and Timetable for each Session appears at the back of this calendar; Spring Session on green paper, Summer Session on yellow paper, On-Campus Evening Degree Credit Courses on blue paper and Evening Credit Program (Off-Campus) on grey paper.

For each course and each section of a course, where applicable, the name of the instructor is given. If it is not possible to satisfy the preference stated on the registration form, the registration will be considered for other sections of the course.

Enrolment per section will be limited and students will be assigned to sections in the order in which their approved registrations are received at the Office of the Registrar. Prospective students should, therefore, apply as early as possible if they wish to have their selections honoured.

Every effort will be made to have the courses, sections, and instructors follow the Calendar descriptions, but courses and sections may be dropped or added, and instructors may not be those listed.

261.7.5 CHANGES AND CANCELLATION OF REGISTRATION

A student who has registered in a course may not transfer from one course to another, or from one term to another, a course, or withdraw from a course or from his program without first obtaining permission from the Dean of his faculty. The permission, in the form of a "Change of Registration" or "Withdrawal" form, signed by the Dean, must be presented to the Registrar before the change becomes official.

A student who abandons a course or withdraws from his program without completing the required forms will not be eligible for any refund of fees,nor for exemption from fees in the event that he had not paid them. For the purpose of calculating refunds the date on which the required forms were signed by the Dean will be used.

Changes in registration will not normally be approved after the deadline specified in the Academic Schedule. Students who abandon a course without their Dean's approval may be assigned a failing grade.

Registration in Summer Session courses may be cancelled for students who have been required to withdraw from the University because of failing academic performance in the immediately preceding regular academic session.

261.8 Fees—Spring Session and Summer Session

For the convenience of students interested in the various sessions, the fee regulations are listed separately for each session. Fees for the Evening Credit Program (Off-Campus) may be found in § 261.9. Fees for On-Campus Evening Degree Credit Courses may be found in § 261.10.

261.8.1 PAYMENT OF FEES

(1) Instruction and General fees are due and payable at the time of registration; registration is regarded as incomplete until fees have been paid. If, for any reason, payment is deferred until after receipt of a fee assessment, payment, together with the copy of the fee assessment card, should be sent immediately to the Comptroller, The University of Alberta, Edmonton.

(2) There is no provision for partial payments.

(3) Fees should be remitted by cheque or money order payable to The University of Alberta. Receipts for the payment of fees will not be issued unless requested later for reimbursement by employer, etc. The cancelled cheque is a receipt. An official tuition fees income tax receipt covering all sessions will be issued before February 28, 1982 to students whose fees are paid in full.

(4) A penalty of $15.00 will be charged on any payment received after the first day of the Session and must be added to any remittance mailed or delivered to the University. See also § 261.7.5 and §261.8.3 for changes of registration and withdrawals and refunds.

(5) Notwithstanding (4) above, students who apply for assistance from the Students' Finance Board on or before their last day for payment of fees without penalty will not be charged a late penalty provided that their loan applications are subsequently approved, resulting in full payment of fees on or before the last day of the appropriate session.

261.8.2 FEE SCHEDULE

The University reserves the right to change its fees from year to year without notice. Students who have not completed their programs when a change is made will pay at the new rate for the balance of their programs.

(1) *Undergraduate* fees are as follows:

INSTRUCTIONAL FEES PER FULL COURSE

All faculties and schools (except as noted below)	$186.00
Engineering	230.00
Dentistry and Medicine (M.D. program only)	276.00
Auditor's fee	72.00

The fee for a half-course is one-half that for a full course.

Maximum Instruction fee per Session:

All faculties and schools (except as noted below)	303.00
Engineering	380.00
Dentistry and Medicine (M.D. program only)	454.00

Visa students see § 261.8.2(3) below for differential fee regulations.

GENERAL FEES

Spring or Summer Session Students' Union	$ 8.00
Spring or Summer Session Students' Union (off-campus courses)	4.00

Students enrolled in both Spring and Summer Sessions must pay Students' Union fees for each session.

University Health Service, Spring Session	3.00
University Health Service, Summer Session	3.00

(2) *Graduate* fees are as follows:

INSTRUCTIONAL FEES

All graduate students who have paid the basic degree program fee in full, for each additional registration in a Spring or Summer Session	$ 60.00
All other graduate students per full course	230.00
Auditor's fees (full course)	72.00

The fee for a half-course is one-half that for a full course.

Visa students see § 261.8.2(3) below for differential fee regulations.

GENERAL FEES

Registration (each Session)	15.00
Graduate Students' Association (Chargeable in Spring Session if student was not registered in immediately preceding Winter Session; chargeable in Summer Session if student was not registered in either the immediately preceding Winter or Spring Sessions)	15.00
University Health Service, Spring Session	3.00
University Health Service, Summer Session	3.00
Re-admission (charged to students permitted to resume an interrupted program)	70.00

Students who register for Spring and/or Summer Sessions will, without registering for the Winter Session, be entitled to (a) receive thesis direction from the division or department and use the library for twelve months, and (b) graduate at Fall or Spring Convocation.

(3) Visa students are assessed a differential fee which is to be added to the Instruction fee in accordance with the following regulations.

(a) For graduate and undergraduate students the differential fee will be $55 per half-course and $110 per full course for each of the Spring and Summer Sessions subject to the maxima noted below.

(b) In no case will the differential fees charged a visa student in the six-month period July 1 to December 31, or January 1 to June 30, exceed the single-term full-time differential fee of $182.00. If change of status to "Landed Immigrant" occurs during a Session there may be a corresponding change to the differential fee charged.

(c) If differential fees continue at the same rate, the following limits will apply to the total differential fees charged to a graduate student while registered in a particular category or program:

Qualifying year(s)	no limit
Master's degree, category A	$364.00
Master's degree, category B	546.00
Ph.D. or Ed.D. for holders of Master's degree continuing in the same field	728.00
Ph.D. or Ed.D. for holders of Bachelor's degree with honors	1,092.00

NOTE: The differential fee does not apply to courses taken for audit.

261.8.3 WITHDRAWALS AND REFUNDS

A student who wishes to withdraw from the University must complete a Notice of Withdrawal form which must then be submitted to his Dean or Director for approval. A student who withdraws without completing such form will not be eligible for any refund of fees nor for exemption from fees in the event that he has not paid them.

Students who withdraw will have their fees re-assessed on a pro rata basis per course to the effective date of withdrawal, except that no re-assessment will be made when the withdrawal date falls in the last week of the course(s). In addition, undergraduate students will be assessed a $10.00 administrative charge, and, in the case of graduate students, the registration fee will be retained.

Refunds will be authorized when the previously paid fee assessment exceeds the assessment to date of withdrawal. The effective date of withdrawal is that on which the Dean or Director signs the required forms.

261.9 Fees—Evening Credit Program (Off-Campus)

For the convenience of students interested in the various sessions, the fee regulations are listed separately for each session. Fees for Spring Session and Summer Session may be found in § 261.8. Fees for On-Campus Evening Degree Credit Courses may be found in § 261.10.

261.9.1 DEFINITION

Instruction fees are set by the Board of Governors, assessed by the Registrar (Graduate Registrar in the case of graduate students) and collected by the Comptroller.

261.9.2 ASSESSMENT OF FEES

For the purpose of assessing fees and fee refunds, the Session is divided into two equal terms. The First Term runs from September through December and the Second Term runs from January through April.

Students are classified as either graduate (those registered in the Faculty of Graduate Studies and Research) or undergraduate (those registered in other Faculties) and sub-classified in each term as either full-time or part-time. A full-time student is any student taking three or more half-courses in a term. A part-time student is any student taking less than three half-courses in a term.

For fee purposes a full-session course will be treated as two half-courses with one half-course applying to each term.

The assessment of instruction fees is done on a "per course" basis. Assessment for both terms will be done at the time of registration.

Schedules of instruction fees for each program are provided in Section 261.9.5.

261.9.3 PAYMENT OF FEES

Instruction and General fees are due and payable at the time of registration; registration is regarded as incomplete until fees have been paid and is subject to cancellation unless payment has been made by the final date mentioned in the following regulations.

(1) Fees should be remitted by cheque or money order payable to The University of Alberta.

(2) Payment should be sent directly to the Comptroller, The University of Alberta, Edmonton. Students whose fees are paid in full will receive official receipts for income tax purposes before the following February 28.

(3) The penalty for late payment is $15.00. The last day for payment of undergraduate fees without penalty for students registered only in the First Term (September to December) is September 30, for students registered only in the Second Term (January to April) the date is January 15. Students registered in both First and Second Terms may pay full fees on or before September 30 or they may pay by instalments and the last dates for payment without penalty are September 30 for First Term and January 15 for Second Term. The first instalment consists of fees assessed for the First Term and the second instalment those assessed for the Second Term plus a $5.00 instalment charge. In addition, if payment has not been made by October 15 for First Term fees and February 1 for Second Term fees, registration will be subject to cancellation and the student to exclusion from classes.

(4) The dates, penalties and registration conditions detailed in (3) above apply to graduate students but amended as to First Term due date if requisite.

(5) Second Term only registrants may receive statements of fee accounts during the First Term.

261.9.4 WITHDRAWALS AND REFUNDS

A student who wishes to withdraw from the University must complete a Notice of Withdrawal form which must then be submitted to his Dean or Director for approval. A student who withdraws without completing such forms will not be eligible for any refund of fees nor for exemption from fees in the event that he has not paid them.

When a student withdraws from one or more courses, his/her fees will be reassessed on a per

course basis with the fee for each dropped course prorated in accordance with the table below. If the total reassessment for a term exceeds the maximum listed for the particular program or faculty, it will be reduced to that maximum.

Also, students who change course(s) from credit to audit will be assessed the table percentage at credit rate and the balance of 100%, if any, at audit rate.

Date of Withdrawal	*Assessment per Term Percentage of Instruction Fee*
First Term	
Prior to Sept. 18*	0
Sept. 18 to 30	20
Oct. 1 to 15	40
Oct. 16 to 31	60
After Oct. 31	100
Second Term	
Prior to Jan 12*	0
Jan. 12 to 31	20
Feb. 1 to 15	40
Feb. 16 to 28	60
After Feb. 28	100

*First day after deadline for registration and changes in registration. Note that corresponding dates for graduate students are October 1 and February 1.

Undergraduate students will be assessed a $10.00 administrative charge on withdrawal from the University and the $15.00 registration fee assessed all graduate students will be retained in the event that a graduate student withdraws from the University.

Refunds will be authorized when the previously paid fee assessment exceeds the assessment to date of withdrawal. The effective date of withdrawal is that on which the Dean or Director signs the required forms. In the event that a revised assessment following withdrawal results in unpaid fees, students will be held responsible for payment in full of the difference.

261.9.5 FEE SCHEDULE

The University reserves the right to change its fees from year to year without notice. Students who have not completed their programs when a change is made will pay at the new rate for the balance of their programs.

(1) *Undergraduate* fees

INSTRUCTIONAL FEES PER HALF-COURSE

All faculties (except as noted below)	$ 93.00
Engineering	115.00
Dentistry and Medicine (M.D. program only)	138.00
Auditor's fee	36.00

The fee for a full course is double that of a half-course.

Maximum Instruction fee per Term:

All faculties (except as noted below)	$303.00
Engineering	380.00
Dentistry and Medicine (M.D. program only)	454.00

(2) *Graduate* fees

INSTRUCTIONAL FEES

Full course	$230.00
Half-course	115.00

GENERAL FEES

Registration	15.00

NOTE: Students who do not have Canadian Citizen or Landed Immigrant status are required to pay a differential fee. See §§ 261.10.7, 261.10.8 and 261.10.10 of the On-Campus Evening Degree Credit Courses fees regulations following.

261.10 On-Campus Evening Degree Credit Courses

261.10.1 DEFINITION

There are two major classifications of fees, Instruction and General. Instruction fees are set by the Board of Governors, assessed by the Registrar (Graduate Registrar in the case of graduate students) and collected by the Comptroller. General fees are set by student governing bodies as well as the Board of Governors and follow the same assessment and collection procedures as Instruction fees.

Fees other than Instruction and General will be assessed in particular cases as they apply (see § 261.10.12).

261.10.2 ASSESSMENT

For the purpose of assessing fees, and fee refunds, the Winter Session is divided into two equal terms. The First Term runs from September through December and the Second Term runs from January through April.

Students are classified as either graduate (those registered in the Faculty of Graduate Studies and Research) or undergraduate (those registered in other faculties) and sub-classified in each term as either full-time or part-time. Full-time undergraduate students are those who are enrolled in the equivalent of three or more half-courses in a term. Part-time undergraduate students are those who are enrolled in the equivalent of fewer than three half-courses in a term. Graduate students are designated as "Full-time" or "Part-time" by the Faculty of Graduate Studies and Research according to their workload of courses and/or research. A more detailed classification of graduate students will be found in § 202.1 of the Graduate Studies and Research Calendar.

For fee purposes a full course will be treated as two half-courses, with one half-course applying to each term.

The assessment of Instruction and General fees for both terms will be done at the time of registration. Instruction fees are assessed on a per course basis up to a certain maximum. Schedules of these fees for each program are provided in § 261.10.7 to § 261.10.12.

261.10.3 PAYMENT

Registration is regarded as incomplete until fees have been paid in accordance with the regulations detailed below (see particularly § § 261.10.4 and 261.10.5).

(1) The following regulations regarding payment of fees apply to undergraduate students (refer to § 261.10.4 for details on late payment penalties):

WHERE: In the Ice Arena.

WHEN: Full fees as detailed on your fee assessment form are due and payable by cash or cheque during Registration Week—Tuesday, September 1 to Saturday, September 5, as scheduled in your Advanced or In-Person Registration Procedures Booklet.

Students who register for the full session may elect to pay fees in two instalments. The first instalment will be the first term assessment. The second instalment will consist of the second term assessment plus an instalment charge of $5.00.

NOTE: Students who do not make payment in accordance with the foregoing should report with fee assessment form to the Comptroller's Office, third floor of the Administration Building. Payment may then be made to the Cashier between the hours of 9:00 a.m. and 4:00 p.m. Monday through Friday.

Students making payments by cheque may follow the above procedure. However, where practical, students are encouraged to place cheques in a special deposit box provided in the main floor rotunda of the Administration Building up to September 30. Cheques may also be mailed to the Comptroller but note that the University cannot accept responsibility for the actions of the post office in cases of payments received by the University after the deadline date. All cheques should be made payable to The University of Alberta. Also, the fee assessment form should be enclosed with the cheque in the special fees remittance envelope which is provided.

The last date for payment of fees without penalty for full session students and First Term only students is September 30.

The last date for payment of fees without penalty for Second Term only students and for the second instalment by full session students is January 15. Payment is to be made as detailed in NOTE above.

Receipts for the payment of fees received by mail will not be issued unless requested later. Your cancelled cheque is your receipt. Students whose fees are paid in full will receive official receipts for income tax purposes before February 28, 1982.

(i) *Students whose fees are to be paid from assistance through The Students Finance Board of The Province of Alberta..*

Upon receipt of the Certificate of Eligibility from the Board, each student should submit all copies to the Fees wicket, where the Confirmation of Enrolment section will be completed, including the amount of fees to be remitted by the bank to the University. The Students Finance Board requires that full Instruction and General fees due to an educational institution are the first charge against any financial assistance awarded. Further, the Board makes provision for full allowance for fees in its first disbursement. In cases where the assistance awarded is less than full fees, the balance of fees payable will be subject to normal fee payment regulations.

Students processing certificates after the September 30 deadline for payment of fees will not be assessed a late payment penalty if:

—the student had appropriately completed the "Financial Assistance Expected" section of the registration form or otherwise had informed the Comptroller's Office not later than mid-September that financial assistance was expected.

—the application for assistance was made to the Board not later than mid-September. Note that it is advantageous to students to submit applications as early as possible, namely from about mid-July onwards.

—the assistance awarded is at least sufficient to pay the first instalment of fees or if not sufficient to pay the first instalment, the deficiency is paid at the date of submission of the Certificate.

(ii) *Students whose fees are to be paid by scholarships, bursaries or other assistance, either directly to or by The University of Alberta.*

If the award is sufficient to pay at least First Term fees, the "Financial Assistance Expected" section of the student's registration form should have been completed, giving the amount of the assistance and the source of the award. If this was not done, the student should submit the information to the Comptroller's Office not later than mid-September.

(iii) *Students who receive assistance directly.*

Students who receive assistance directly, i.e., not through the University, are subject to normal fee payment regulations and they are required to follow the payment procedure detailed in (i) above, even though the University may be required to provide confirmation of registration.

(iv) *Students age 65 and over who are eligible for remission of fees.*

Students eligible for remission of fees shall:

—be age 65 or more at commencement of the Session,

—submit proof of age,

—be a resident of the Province of Alberta.

The remission of fees (including auditing fees) shall apply to undergraduate credit courses only. The Application for Remission form is available at the Fees wicket, third floor of the Administration Building, and should be completed prior to September 30 (January 15 in the case of Second Term only registrants).

(2) Similar regulations to those detailed in (1) above apply to graduate students, with the following changes (refer to § 15.2.4 for details on late payment penalties):

(i) During registration a fee information sheet will be given to each graduate student who will then calculate the amount of his fee assessment and pay same in accordance with (1) above. Subsequently, a fee assessment form will be mailed to each student showing the amount of his fees. In the event that this amount is greater than that calculated by the student, the difference is due and payable immediately on receipt of the mailed assessment form.

(ii) Graduate students who elect to pay fees in instalments may do so as follows:

First instalment—First Term fees as calculated by student (see (i) above) due not later than September 30.

Second instalment—Second Term fees plus a $5.00 instalment charge, due on or before January 15.

261.10.4 LATE PAYMENT PENALTIES

(1) *Undergraduate students*

(i) The last day for payment of fees is September 30. If the student is paying in two instalments, the last day for payment of the first instalment is September 30; and for the second instalment, January 15. A penalty of $15.00 will be charged when the payment is received by the University after these dates. Students are reminded that the University cannot accept responsibility for the actions of the post office if payments are not received by a deadline date. In addition, if payment has not been made by October 15 for First Term fees and February 1 for Second Term fees, registration will be subject to cancellation and the student to exclusion from classes.

(ii) When registration is cancelled, a reassessment of fees will be made to the date of cancella-

tion and the amount unpaid entered on the student's record. Future registrations will not be accepted and all certification of academic records will be withheld until the account has been settled.

(iii) When a student has been permitted to register late, the last date for payment of fees will be fifteen days after the date of assessment. A penalty of $15.00 will be charged when the payment is received after this date. If payment is in instalments, the last date for payment of the second instalment is January 15 and the above penalty provision applies.

(iv) The last day for payment of fees for those students who are registered in Second Term course(s) only is January 15. A penalty of $15.00 will be charged when the payment is received after this date. In addition, if payment has not been made by February 1, registration will be subject to cancellation and the student to exclusion from classes together with action by the Registrar detailed in (ii) above.

(2) *Graduate students.*

A penalty of $15.00 may be charged when payment of First Term fees is received after September 30, and, when paying by instalments, payment of Second Term fees is received after January 15. In addition, if any fees remain unpaid by February 1, registration will be subject to cancellation and the student to exclusion from classes. Refer to (1)(ii) above for resulting action by the Registrar. The same conditions as stated above for payment of Second Term fees apply to students assessed fees for the Second Term only.

261.10.5 WITHDRAWALS AND REFUNDS

Students who wish to withdraw from the University should report at once to Student Counselling Services in order to complete "Notice of Withdrawal" forms which must then be submitted to the Dean for approval. Students who withdraw without completing such forms will not be eligible for any refund of fees nor for exemption from fees in the event that they have not been paid.

When a student withdraws from one or more courses his/her fees will be assessed on a per course basis with the fees for each dropped course prorated in accordance with the table below. If the total reassessment for a term exceeds the maximum listed for the particular program or faculty, it will be reduced to that maximum.

Also, students who change courses from credit to audit will be assessed the table percentage at credit rate and the balance of 100%, if any, at audit rate.

Assessment per Term
Percentage of

Date of Withdrawal	Per Course and General Fees
First Term	
Prior to Sept. 18*	0%
Sept. 18 to 30	20%
Oct. 1 to 15	40%
Oct. 16 to 31	60%
After Oct. 31	100%
Second Term	
Prior to Jan. 12*	0%
Jan. 12 to 31	20%
Feb. 1 to 15	40%
Feb. 16 to 28	60%
After Feb. 28	100%

*First day after deadline for registation and changes in registration. Corresponding dates for graduate students are October 1 and February 1.

Undergraduate students will be assessed a $10.00 administration charge on withdrawal from the University and the $15.00 registration fee assessed all graduate students will be retained in the event that a graduate student withdraws from the University.

Graduate students whose fees are assessed on a program basis rather than on a per course basis will, for the purpose of fee assessment on withdrawal, be assessed a maximum of one-half of full Winter Session fees for each of the two terms.

Refunds will be authorized when the previously paid fee assessment exceeds the assessment to date of withdrawal. The effective date of withdrawal is that on which the Dean signs the required forms. In the event that a revised assessment following withdrawal results in unpaid fees, students will be held responsible for payment in full of the difference.

261.10.6 CHANGES IN FEES AND FEE PAYMENT PROCEDURES

The University reserves the right to change its fees from year to year without notice. Students who have not completed their program when a change is made will pay at the new rate for the balance of their program.

261.10.7 UNDERGRADUATE FEES

(1) *Instruction fees* are charged for each term of the Winter Session as follows:

For fee purposes a full course is treated as two half-courses, with one half-course applying to each term.

All faculties (except as below)	
Per half-course	$ 93.00
More than 3 half-courses, maximum	303.00
Engineering	
Per half-course	115.00
More than 3 half-courses, maximum	380.00
Dentistry and Medicine (M.D. program only)	
Per half-course	138.00
More than 3 half-courses, maximum	454.00
Medical Laboratory Science (third year only)	151.00
Visa students (add differential fee to Instruction fee above)	
Per half-course	55.00
More than 3 half-courses, maximum	182.00

In no case will the differential fees charged a Student Visitor (Visa Student) in the six-month period July 1 to December 31, or January 1 to June 30, exceed the single term maximum differential fee of $182.00. If change of status to Permanent Resident (Landed Immigrant) occurs during a Session, there may be a corresponding change to the differential fee charged.

(2) *General Fees* are charged for each term of the Winter Session as follows:

Students' Union (except as below)	
Taking one or two half-courses	5.00
Taking three or more half-courses	18.50
Students' Union (students in Dentistry, Education (B.Ed./A.D. and Diploma programs), Law, Medicine first and second years) taking three or more half-courses	14.50
Students' Union (students in Medicine third and fourth years)	3.00
University Athletic Board (Due to high demand, facilities are not always available.) Optional at registration if taking one or two half-courses	13.00

University Athletic Board	
Taking three or more half-courses	13.00
University Health Service	
(See § 261.16.2) Optional at registration if taking one or two half-courses. Mandatory if taking three or more half-courses	6.00

The fee for a full course is double that of a half-course. This applies as well to the differential fee assessed Student Visitors (Visa Students).

261.10.8 UNDERGRADUATE PROGRAM FEES

The following fees are charged by program for students registered in the Faculty of Nursing in the Advanced Practical Obstetrics and Nurse Practitioner Certificate courses:

(1) Instruction fee	$224.00
(2) General Fees	
Registration (Advanced Practical Obstetrics only)	$ 12.00
Registration (Nurse Practitioner only)	6.00
Students' Union (Associate Membership)	5.00
University Athletic Board (Optional at registration)	13.00
University Health Service (Optional at registration)	6.00

261.10.9 UNIVERSITY OF ALBERTA HOSPITAL SCHOOL OF NURSING

The following fees are charged for each term for students registered in the diploma course in nursing at the University of Alberta Hospital School of Nursing:

Students' Union privileges	$ 10.25
University Athletic Board (Optional at registration)	13.00

NOTE: These students are entitled to University of Alberta Library privileges.

261.10.10 FULL-TIME GRADUATE PROGRAM FEES

Students who commenced their program prior to the current Winter Session will be charged at the rates shown below only for that portion of the program fee applicable to their registration in the current Winter Session and subsequent sessions.

(1) *Instruction fees.* Except where otherwise noted, the following fees are the current total amounts for the minimum period within which it is possible for a student to complete the degree program:

Qualifying year for holders of any bachelor's degree from a three-year undergraduate program (The University of Alberta or equivalent)	$ 759.00
Master's degree, for holders of a bachelor's degree from a four-year program continuing in the same field (equivalent of University of Alberta honors degree) Category A	759.00
Master's degree, for holders of a bachelor's degree from a four-year program (beyond senior matriculation), changing field or specializing for the first time—Category B	1,139.00
Doctor of Philosophy or Doctor of Education degree for holders of a master's degree continuing in the same field, $759.00 a year for two years	1,518.00
Doctor of Philosophy or Doctor of Education degree for holders of a bachelor's degree with honors, $759.00 a year for three years	2,277.00
To maintain continuous registration when not otherwise registered in course(s), and for all doctoral and master's candidates, and qualifying graduate students, per year of registration after total instruction fee has been paid	60.00

Student Visitors (Visa Students) are assessed a differential fee which is to be added to the Instruction fee above in accordance with the following regulations.

(a) For full-time graduate students the differential fee will be $182.00 for each of the first and second terms up to the maxima noted below.

(b) For part-time graduate students the differential fee will be $55 per half-course and $110 per full course subject to the maxima noted below.

(c) In no case will the differential fees charged a Student Visitor (Visa Student) in the six-month period July 1 to December 31, or January 1 to June 30, exceed the single-term full-time differential fee of $182.00.

(d) If differential fees continue at the same rate, the following limits will apply to the total differential fees charged to a graduate studnet while registered in a particular category ro program:

Qualifying year(s)	*no limit*
Master's degree, category A	$ 364.00
Master's degree, categoty B	546.00
Ph.D. or Ed.D. for holders of Master's degree continuing in the same field	728.00
Ph.D. or Ed.D. for holders of Bachelor's degree with honors	1,092.00

If change of status to Permanent Resident (Landed Immigrant) occurs during a Session there may be a corresponding change to the differential fee charged.

(2) *General fees* are charged per session as follows:

Registration	$ 15.00
Graduate Students' Association	34.00
Students' Union privileges (optional at registration)	29.00
University Athletic Board	26.00
University Health Service (See § 261.16.2)	12.00
Re-admission (charged to students permitted to resume an interrupted program)	70.00

In the qualifying year, a normal program is four or five full session courses (or the equivalent).

Programs for candidates for the master's degree classified in Category "A" will normally not exceed five full session courses (or the equivalent). Those classified in Category "B" will normally not exceed seven full session courses (or the equivalent).

Courses shown on the Program Form of the student as "extra" to the degree program, or to clear deficiencies, will be charged for at the rate per course for the faculty offering the course—see § 261.10.7(1)—in addition to the regular fee for the degree program. This applies to Probationary Graduate Studies as well as to candidates for degrees.

Special Graduate Students and Exchange Graduate Students will be charged $230.00 per full session course and $115.00 per half course to a maximum of the fee for a full year's program.

Students who attend Summer Session and/or Spring Session will be assessed fees for these sessions in addition to any assessment for Winter Session since they are separate from the Winter Session. However, all tuition fees paid for courses on programs in Spring and/or Summer Session will be credited toward the total program fee for the

student. Any outstanding balance will be assessed in the student's final session.

261.10.11 PART-TIME GRADUATE PROGRAM FEES

Students who commenced their program prior to the current Winter Session will be charged at the rates shown below only for that portion of the program fee applicable to their registration in the current Winter Session and subsequent sessions.

(1) *Instruction fees.* Part-time graduate students will be charged $230.00 for each full course and $115.00 for each half course they take, up to the amount of the total Instruction fee for the full program. Any outstanding balance will be assessed in the student's final session. Student Visitors (Visa Students) are referred to § 261.10.10(1) for regulations governing assessment of the Instruction differential fee pertaining to part-time graduate students.

(2) *General fees* are charged per session as follows:

Registration	$ 15.00
Graduate Students' Association (Intramural students only)	23.00
University Athletic Board (Due to high demand, facilities are not always available) (optional at registration)	26.00
University Health Service (See § 261.16.2.) (Optional at time of registration)	12.00
Re-admission (charged to students permitted to resume an interrupted program)	70.00

(3) *May-August Period (Intersession)*

University Health Service for students registered in courses in the May-August period	
Spring Session	3.00
Summer Session	3.00
University Health Service for students not registered in courses in the May-August period (Optional at time of registration)	6.00

261.10.12 OTHER FEES

(1) *Auditing fees.* The fees for the privilege of auditing a course are:

Full course	$ 72.00
Half course	36.00

The differential fee for Student Visitors (Visa Students) does not apply to courses taken for audit.

(2) *Examination fees.* No fee is levied for *final examinations* written during regular examination periods.

A fee of $15.00 is charged for each *supplemental examination* written during a regular supplemental examination period. *Supplemental examinations are not granted to students in the Spring and Summer Sessions.*

For a *special supplemental examination* a fee of $60.00 is charged for each paper. Where the student has been prevented by illness or other extreme circumstances from writing at the regular supplemental examination time, a portion of the fee may be waived.

A fee of $6.00 is charged for each *deferred final examination* written during a regular supplemental examination period. The fee for a special deferred final examination is $60.00 per paper. Where the student has been prevented by illness or other extreme circumstance from writing at the regular deferred examination time, however, a portion of the fee may be waived.

An additional fee of $20.00 per paper is charged for conducting a supplemental or deferred final examination at an established centre other than Edmonton.

(3) *Special fees.* The following special fees will be assessed in particular cases as they apply:

Transcript fee: the first 10 copies are supplied free of charge; thereafter, the fee is $5.00 for the first copy plus 50¢ for each additional copy ordered at the same time.

Application for Admission fee	$ 20.00
Vise fee for the evaluation of documents of persons not seeking admission to the University	15.00
For indexing and microfilming of doctoral thesis by the National Library of Canada	15.00
Course credit by special assessment	75.00
Final examination re-appraisal	20.00

261.11 Academic Regulations

261.11.1 PRE-SESSION STUDY

Where pre-session study is a requirement, this is indicated in the schedule of the courses offered, and the students concerned will be sent study outlines by the Office of the Registrar. Information concerning required textbooks may be obtained from the University bookstore. For further information please refer to § 261.12.8 of this calendar.

Where pre-session study is required, examinations on the prescribed preparatory study may be held during the first week of classes. If preparation proves to be inadequate, a student may be asked to withdraw from the course. This requirement makes it essential that registration be completed at an early date, textbooks secured, study commenced, and work carried forward consistently.

261.11.2 RESIDENCE REQUIREMENTS

(1) A student proceeding towards a first degree normally must attend at least one academic year and complete a full year's program.

(2) The final year of a degree program must normally be taken in attendance at The University of Alberta.

(3) If a student has fulfilled the first requirement before beginning the final year of his program, he may apply to the Dean of his faculty for permission to fulfill the second requirement by attendance at Spring Session or Summer Session or by taking On-Campus Evening Degree Credit Courses.

261.11.3 ATTENDANCE

Since presence at lectures, participation in classroom discussions and projects, and the completion of assignments are important components of most courses, students will serve their interests best by regular attendance. Those who choose not to attend must assume whatever risks are involved.

261.11.4 EVALUATION PROCEDURES AND GRADING SYSTEM

At the beginning of the session each instructor will announce the distribution of weight between term work and final examinations in each course, and also the policy with respect to supplemental examinations. In addition he will outline the evaluation procedures to be used and explain the grading system.

The grading system uses the following nine grades:

9	
8	Excellent
7	
6	Good
5	
4	Pass
3	(see Note)
2	Fail
1	

NOTE: A grade of 3 in an individual course will be accepted by some faculties but only if warranted by a student's over-all academic record.

In courses taken towards an undergraduate degree or for those used as a prerequisite to another course, the minimum passing grade is 4 unless otherwise specified; in courses taken towards a graduate degree the minimum passing grade is 6. Under the percentage system previously in use, the minimum passing grade in courses taken towards an undergraduate degree was 50 per cent; in courses taken towards a graduate degree, 65 per cent.

Some courses may be offered on a "Pass"/"Fail" basis. Conditions under which a student may take such a course are specified by his faculty council.

Aegrotat Standing may be granted, in special circumstances, on the grounds of illness to a deserving student who has completed at least one year at The University of Alberta in the Faculty in which he is currently registered. Any student wishing to take advantage of this privilege should apply without delay to the Dean of the faculty concerned. Any other student absent from a final examination because of illness may apply for permission to write the regular deferred examination. [See § 261.11.5].

261.11.5 EXAMINATIONS

The following regulations apply to *term examinations:*

(1) *Term examinations optional.* The holding of term examinations is optional with each department.

(2) *Test Week.* Although instructors may give tests during any regular lecture or laboratory period at their discretion, one week in the middle of each of the First Term and the Second Term of the Winter Session has been set aside as test week. During these weeks off-campus extra-curricular activities will not normally be organized by the University.

(3) *Absence from term examination or test.* If a student has an unexcused absence from a term examination or test, the raw score assigned to him will be zero. However, in case of illness or other extreme circumstance the student may be excused from writing the examination or test. In applying for exemption a student must present to his instructor an absence slip signed by a University Health Service Physician where the cause is illness, or by the Registrar where the cause is other than illness. When exemption is granted the percentage weight allotted to the examination or test missed is added to the percentage weight allotted to the final examination.

The following regulations apply to *final examinations:*

(1) *Final examinations.* A final examination is held in each course except where departure from this arrangement has been authorized by the Council of the faculty in which the department offering the course is situated. A weight of not less than 30 per cent and not more than 70 per cent will be assigned to the final. The remaining weight for the course will be assigned to the term work. In courses completed in the First Term of the Winter Session, final examinations are normally held during test week in December. All final examinations for Second Term and full courses are held at the end of the Session. Examinations for On-Campus Evening Degree Credit Courses and Evening Credit Program (Off-Campus) courses are held during the last regular class period.

(2) *Absence from final examinations.* Any student who is ill or suffering from severe domestic affliction is advised not to sit for a final examination. Instead he should advise the Registrar at once of the circumstances and should apply for a deferred examination. Similar action should be taken by any student, who, because of religious convictions or for other cogent reasons, is unable to write a final examination at the scheduled time. Such applications will be referred to the student's Dean for a final decision.

When a student is absent from a final examination without acceptable excuse, a final grade may be computed using a raw score of zero for the final examination. In other cases the final grade will be shown as "Absent". The policy with respect to which method of reporting the final grade is to be used, will be determined by the faculty in which the department offering the course is situated. For the purpose of evaluating the student's overall performance the interpretation of the grade assigned is the responsibility of the faculty in which the student is registered and it may determine what action will be taken.

(3) *Cancellation of paper during examination.* If a student becomes ill or receives word of domestic affliction *during* the course of an examination, he should report at once to the Supervisor, hand in his unfinished paper, and request that it be cancelled. Thereafter, if illness is the cause, he must go directly to the University Health Service so that any subsequent application for a deferred examination may be supported by a medical certificate. The Registrar should be notified in writing of the circumstances within forty-eight hours of the examination. In certain cases, the decision may be to grant a deferred final examination, which will carry with it no supplemental privilege in case of failure.

(4) *No subsequent cancellation of papers.* Should a student write an examination, hand in his paper for marking, and later report extenuating circumstances to support a request for cancellation of his paper and for another examination, such request will not be entertained.

(5) *Debarment from final examination.* A student may be refused permission to write the final examination in a course, on the recommendation of the department concerned and with the concurrence of the Dean of his faculty, in the following circumstances:

(i) The student has neglected to do a substantial portion of his written assignments in a course of which these are an essential feature, or has attended insufficiently in a course in which class participation is a necessity.

(ii) The student has neglected to do a sufficient amount of the practical or laboratory work in a course in which these are considered a basic requirement.

(6) *Failure in First Term Course.* A student who has failed the first single-term course in a two single-term course sequence, may proceed to the second single-term course unless his faculty has ruled otherwise.

(7) *Release of Final Examination Papers.* Departments subscribing to the belief that there is educational value in permitting students to see their final examination papers after they have been marked, may arrange for this to be done. However, papers should not actually be released to students until the deadline for applications for reappraisal has passed, as an appeal cannot be entertained after the custody of the paper has been relinquished to the student.

The following regulations refer to the *notification of results.*

(1) *Release of Grades.* Only the Registrar's Office is empowered to issue official statements of results or transcripts of records. However, Department Chairmen, or their delegates, are authorized and instructed to release final grades for Winter Session in First Term courses by January 10, and in Second Term or full-session courses by May 15, in any manner that will protect the confidentiality of individual student grades. After the end of each university session a statement of record is mailed to each student at the home address specified on his registration. This should not be expected before June 1 at the earliest for the preceding Winter Session.

(2) *Reappraisals.* Since great care is taken in marking final examination papers, a student should apply for reappraisal of a paper only if he has good reason to believe that a mistake has been made. Reappraisals are dealt with by the chairman of the department in consultation with members of the staff. A request for reappraisal must be made by letter to the Registrar (or by completion of an application form in the Registrar's Office) by January 24 in the case of First Term courses, by June 25 for other Winter Session courses, and within thirty days of the publication of results for courses offered in the Spring and Summer Sessions. The request must include a statement of whether the intent of the appeal is to raise or lower the grade. If a student fails to include such a statement it will be assumed that the intent is to have the grade raised. The request must be accompanied by a fee of $10.00 for each paper; the fee will be refunded if the appeal is successful.

The reappraisal privilege is limited to two papers per term in the Winter Session and to a total of two papers for Spring Session and two papers for Summer Session. Normally there is no such privilege for supplemental examinations. Students who have been granted the supplemental privilege and who are awaiting the outcome of a reappraisal should make application for supplemental examinations by the prescribed deadline. Please note however, that the supplemental privilege is not extended to students registered in the Spring or Summer Sessions.

It should be understood that if the grade is changed, the new grade, whether higher or lower than the original, replaces it as the student's official grade in the course.

The following regulations apply to *Supplemental examinations granted in the Winter Session:*

(1) *Granting of Supplementals.* Supplemental examinations may be granted by a faculty council in cases where the weight assigned to the final is 40% or higher. Notwithstanding anything in the preceding regulations, in any faculty where a student must complete an entire year's work satisfactorily before proceeding to the next, supplemental examinations may also be granted in a course taken exclusively by students of the faculty in question, even where the weight of the final examination is less than 40%, provided the weight assigned to the supplemental is at least 60%.

In sections of a multi-sectioned course the distribution of weight will be such that there will be a uniform policy determined by the Department with regard to the granting of supplemental examinations.

(2) *Number of supplementals.* The number of supplemental examinations permitted a student is determined by his faculty council. The privilege of writing supplemental examinations may be withheld by the faculty council if the student's grade in the course is very low, or if his grade-point average, including the course or courses failed, is below that required for promotion. Notification of permission to write one or more supplemental examinations is included in the statement of marks sent to each student.

(3) *Weighting of supplementals.* The percentage allotted to the supplemental examination will be not less than that which was allotted to the final examination.

(4) *Application.* A student who has been granted the privilege of a supplemental examination must apply to the Registrar not later than the deadline shown in the Academic Schedule (§ 261) remitting the prescribed fee. No late applications will be accepted.

(5) *Supplemental examination schedule.* A student must write his supplemental examinations at the time of regular supplemental examinations next following unless he has been granted an extension by his Dean. Extension of a supplemental privilege beyond one year of the time that the final examination was written will not be granted.

Supplemental examinations will be held early in August. However, a student in his graduating year who has an excused absence form, or who fails in a First Term final examination in December may, by permission of his Dean, be allowed a supplemental examination during the Second Term Reading Week or at the end of the session. Application for such an examination must be made at least three weeks before the commencement of the examinations. (See the Academic Schedule, § 261 above.)

(6) *Failure in supplemental examination.* A student who returns to the University having failed a supplemental examination, or having neglected to write it, will be required to repeat the course. In certain cases an equivalent course may be prescribed instead of the failed course.

(7) *Failure in graduating year.* A member of the graduating class who, having exhausted all the regular supplemental examination privileges, has still a failure in one course only, may, with the permission of the faculty council concerned, register in and repeat that course extramurally, unless, in the opinion of the department concerned, it is necessary for him to attend classes in the course a second time.

The following regulations apply to *deferred final examinations.*

(1) *Deferred final examinations.* A student who has missed a final examination because of illness or domestic affliction or who is obliged to absent himself from an examination for some other compelling reason (including religious convictions) may apply for a deferred final examination. Application for such examination must be made to the Registrar by the deadline prescribed in the Academic Schedule (§ 261), must be supported by a satisfactory medical certificate in the case of illness, and must be accompanied by the prescribed fee. Deferred final examinations may be written at the same time as the regular supplemental examinations or as follows.

(2) *Deferred First and Second Term and Full Session Final Examinations in Winter Session.* A student who cannot take a First Term final examination in December or a Second Term final in April because of illness or other compelling reason may be granted a deferred final examination. The time and place of the deferred final examination may be set by mutual agreement among those students who have missed the final examination for good cause and the instructor. If it is not possible to reach mutual agreement, then the examination should be held by the time of the March recess for First Term courses and as soon as possible after the end of the Second Term for Second Term and full session courses. If agreement on a date cannot be set by the instructor and the students requesting the privilege for Second Term courses, then the examination will be held during the regular supplemental and deferred final examination period in August. Application for such examination must be made to the Registrar and must be supported by a satisfactory medical certificate in the case of illness, and must be accompanied by the prescribed fee.

(3) Any student who is granted a deferred final examination in either the First Term or Second Term of a Spring Session course by his or her Dean may write that examination as soon as possible after the end of the term at a time and place mutually agreeable to the student and to the instructor and to any other students in the course requesting the same privilege. If agreement is not possible, the examination will be scheduled during the regular supplemental and deferred final examination period in August.

Any student who is granted a deferred examination in a course in either term of the Summer Session by his or her Dean may write that examination as soon as possible after the end of the term at a time and place mutually agreeable to the student and to the instructor and to any other students in the course requesting the same privilege. If agreement is not possible, the examination will be scheduled on the special supplemental and deferred final examination day in September.

In order to ensure that applications for the writing of deferred examinations for the students attending in the Spring and Summer Sessions are received in time to be processed, students are advised to submit their application to the Registrar's Office as the necessity arises and not to wait until they receive their statement of results.

The following regulation applies to *Special Examinations.*

(1) A special supplemental or a special deferred final examination may be granted to a student who is prevented by illness (attested by a physician), domestic affliction, or other extreme circumstance from writing a supplemental examination or a deferred final examination at the regular time in August. Application must be made to the Registrar a full month before the special examination is to be written, and must be accompanied by the prescribed fee. Special examinations are normally written on the Saturday following the Fall registration period. In certain approved cases they may be written during the regular examination periods in April, May, August, or September.

261.11.6 APPEALS AND GRIEVANCES

General Faculties Council has instructed each faculty to publish in its calendar not only its academic regulations, but also the procedures that it uses for dealing with appeals against decisions affecting the academic standing of a student.

In addition, General Faculties Council has established an Academic Appeals Committee and has delegated to it authority to hear appeals from students on the following matters:
(1) Transfer from one program or faculty to another;
(2) Continuation in a program;
(3) Graduation.
(4) The G.F.C. Academic Appeals Committee is also authorized to hear an appeal from a decision to refuse admission to a non-quota program from a student of a public or private community college, institute of technology, or regional agricultural and vocational college, who falls within the purview of the Admission and Transferability of Credit Policies of The University of Alberta.

A student is expected to exhaust the provisions for appeal within his own faculty before taking an appeal to the G.F.C. Academic Appeals Committee.

The G.F.C. Academic Appeals Committee is not authorized to hear an appeal from a decision respecting a mark in an individual course, from an examination decision made in the Faculty of Graduate Studies and Research, or from a decision to refuse admission to a quota faculty.

For further information regarding appeal procedures at the faculty level a student should seek the advice of his Dean. A student who has been unsuccessful in appealing at the faculty level and who wishes to appeal to the G.F.C. Academic Appeals Committee should consult the Secretary of General Faculties Council in order to learn the procedures to be followed.

261.12 Academic Standing

261.12.1 FIRST-CLASS STANDING

First-class standing in a given year shall be awarded to any student who obtains a grade-point average of not less than 7.5 while enrolled in a full normal academic course load in that year; the definition of a full normal academic course load shall be left to the faculty concerned.

261.12.2 DEGREES WITH HONORS

A student in the Faculty of Arts or of Science with approved qualifications may proceed to the degree of Bachelor of Arts or Bachelor of Science with Honors by following a more concentrated course of study in a special field under the supervision of one of the departments. The time required for an honors degree is four years from senior matriculation.

Degrees with Honors are awarded in two classes: First Class Honors, and Honors, in accordance with the requirements of the faculty and department concerned.

261.12.3 DEGREES WITH DISTINCTION

The notation "With Distinction" is inscribed on the permanent record and graduation parchment of a candidate for any degree, except an honors or graduate degree, if the candidate has obtained a grade-point average of 7.5 or higher over the last two years of his program. In the B.F.A. and B.Mus. programs, the candidate is normally required to carry a full course load in each of the last two years. A student who has taken part of his work at another university may be granted a degree "With Distinction" at the discretion of the faculty concerned.

261.12.4 PROMOTION

Promotion regulations are set by the faculties of the University. Details will be found in the Faculty Regulations Section of the appropriate Faculty calendar.

261.12.5 UNSATISFACTORY STANDING

(1) A student who has been admitted to the University with a weak matriculation record may be warned of the fact at the beginning of his first session.

(2) The records of all students are reviewed at the end of each session. A student whose record is found to be unsatisfactory will be notified by his Dean and may be referred to the Student Counselling Services for recounselling. He may be denied the privilege of writing supplemental examinations and required to repeat his year. A student whose record is extremely unsatisfactory may be required to withdraw from the University, and normally at least a year must elapse before re-admission will be granted.

(3) A student who has been required to withdraw will not be permitted to re-enter without applying to the Dean of the faculty in which he proposes to register. The Dean may require a student to undergo counselling as a part of the process for obtaining re-admission. A student seeking re-admission must report his intention by letter to the Dean not later than mid-June of the year in which re-admission is sought. The letter should include an explanation of his previous difficulties and indicate why the applicant believes that he may now be successful.

(4) A student with an extremely unsatisfactory record at another university will not be considered for admission to The University of Alberta until at least a year has elapsed from the date of his leaving his former university. Thereafter, the procedure outlined in (3) will apply.

(5) Subject to the control of the General Faculties Council, a faculty council may refuse permission to a student or prospective student to enter any year of a program if, in the opinion of the council, the student shows a lack of general educational attainment. Moreover, a student whose record in the classroom, in test, or in final examinations is unsatisfactory may be required to withdraw from the faculty at any time.

261.13 Student Records

261.13.1 CONTENTS OF FILES

(1) Only letters and documents pertinent to a students' admission and academic record may be kept in the official files of the Registrar, the Deans, and the Departmental Chairmen.

(2) Application for Admission forms of any Faculty requiring letters of reference must contain a statement to the effect that the Faculty reserves the right to solicit information from persons other than those named by the applicant as his referees provided the student is advised of the names or the offices consulted as additional referees.

261.13.2 STUDENT RECORDS

(1) Official transcripts are issued only upon the request of the student. They are issued to him personally or to whomever he designates. An official transcript bears the original signature of a member of the Registrar's staff who has been given authority to sign transcripts, and the official seal of the University is imprinted over the signature.

(2) Unofficial copies of the student's academic record are issued to the student in the form of his year-end Statement of Results; to the student's Dean, and to the Chairman of the Department or his designee, in the case of a student registered in a specialized, honors or graduate program. An unofficial transcript or copy of the student's academic record bears neither an original signature nor the University seal.

(3) Unofficial copies of the student's academic record may be issued to the following at their request: Student Counselling Services, when a student has been referred for counselling by an authorized officer of the University; and the Student Awards Office, where an award made through a University scholarship committee is involved, on the understanding that information regarding the student's academic record will not be furnished to the scholarship donor without the student's consent.

(4) Unofficial copies may be issued at the student's request to other offices or individuals in the University.

(5) Public information regarding students, such as dates of attendance, place and date of birth, city and home address, verification of degree or degrees may be issued at the discretion of the authorized officer of the University to educational institutions, appropriate government agencies, prospective employers, and scholarship donors.

(6) Academic and disciplinary records are separate. The only disciplinary action that will be documented on a student's academic record is one involving his suspension or expulsion from the University. There is to be only one official disciplinary record. Prior to January, 1974 disciplinary records were kept by the Dean's Council. Since that date they have been kept in the custody of the Secretary to the General Faculties Council, the Officer responsible for implementing University Disciplinary Procedures. The only persons having access to such record will be those directly concerned with the action.

(7) Where access to academic records is sought for the purpose of research, such access may be granted by the Executive Committee of General Faculties Council on such terms as may be necessary to ensure the confidentiality of individual student records. Research on student data will be defined as not being within the normal administrative operation of the University. In case of doubt as to what may fall within "the normal administrative operation of the University", the G.F.C. Executive committee will decide.

261.13.3 LETTERS OF REFERENCE AND RECORDS

(1) The contents of letters of reference regarding a student will not be revealed to the student without the permission of the referee. Letters of reference will be used only for the express purpose for which they have been supplied unless the permission of the referees and the student concerned has been given for other purposes.

(2) Where a student has gone on his own initiative as a patient to University Health Service, or as a client to Student Counselling Services, the contents of his file are private, in accordance with professional ethics or codes of behavior.

(3) Where a student has been referred by an authorized officer of the University to the University Health Service or to the Student Counselling Services, the consultant's opinion will be reported to the authorized officer if the student gives written permission to do so. Such written permission shall be granted when the student signs a release form, the nature of which will be determined by the Service in question. The nature and content of any report provided by the consultant will be determined by the ethics and codes of behavior of the consultant's profession. If the student authorizes the consultant to release a report, the consultant may, at his discretion, discuss the contents of the report with the student.

(4) Confidential information regarding a student's record may be divulged by a faculty member to institutions, agencies or prospective employers only with the student's knowledge and consent. A faculty member, when called upon to do so, may use his discretion in expressing his opinion to such institutions, agencies or prospective employers concerning a student's academic ability, character and personality. However, a record of the opinion so expressed will not become part of the student's file.

261.13.4 EXCEPTIONS TO STATED POLICY

Any student who objects to the release of information regarding his academic record, in accordance with the policy stated above, should notify the Registrar in writing, giving his specific objection. Appropriate action will be taken by the Registrar and he will so advise the student.

261.14 General Regulations and Information

261.14.1 WITHHOLDING OF UNIVERSITY DOCUMENTS

In any case where a student has neglected or refused to pay amounts owed to the University, the Registrar has been empowered and directed by the Board of Governors to withhold all forms of certification of the student's marks or of other indicia of academic attainment, such as graduation diplomas, until the student has settled his account with the University. For example, certification with respect to the student's academic attainment may be withheld if the student owes the University for library penalties or fines; for purchases at the University Bookstore; for parking or traffic violations; for breakage or damage to laboratory facilities or supplies; for student fees and University of Alberta Emergency Student Loans ; for room and board fees; for fees for supplemental or deferred final examinations; and, for fines imposed by the Discipline, Interpretation, and Enforcement Board of the Students' Union.

261.15 Student Conduct and Discipline

261.15.1 GENERAL INFORMATION

When a student enters the University, it is expected that he will apply himself to his studies and conduct himself with propriety. Should a student fail to live up to these expectations, the University reserves the right to take such action as, in its opinion, the case warrants.

Any person believing that a student has committed an offense against University rules may, by a statement in writing delivered to the Officer responsible for disciplinary procedures (the Secretary to General Faculties Council), require the Officer to prepare and serve a charge upon such student. General University Disciplinary Panels (consisting of three persons of whom two are students) have been established to hear such charges and appeals from Panel decisions may be made to a University Appeal Board of like composition. The Disciplinary Panels by delegation of authority from General Faculties Council, are empowered to fine students, to suspend or to expel. In cases of academic dishonesty, such as plagiarism, the complaint is made in the first instance to the student's instructor. If the offense is serious it will be referred to the dean of the student's faculty who may in turn refer the complaint to the General University Panel.

The Students' Union deals with matters of student discipline coming within its purview. For this purpose it has set up a Discipline, Interpretation and Enforcement Board. Appeal from rulings of this Discipline Board or the Lister Disciplinary Committee is to the G.F.C. Disciplinary Tribunals.

The assistant deans for residence, in conjunction with the elected student committees in the residences, are responsible for the supervision of conduct in the halls of residences.

There is also a Dean of Students who is prepared to assist students in disciplinary matters.

A student who feels he has a legitimate grievance that has not been adequately dealt with through other channels has the right to petition any of the governing bodies of the University through the President of the University.

261.15.2 CODE OF STUDENT BEHAVIOR

(Approved by G.F.C. February 24, 1975, and received by Board of Governors April 4, 1975)

PART 1 *Enactment and Amendment of the Code*

1. There is hereby established in the following sections the Code of Student Behavior, hereinafter referred to as the "Code".

2. The General Faculties Council may, from time to time, amend the Code. (Note: Under § 39 of the Universities Act the General Faculties Council is empowered to exercise disciplinary jurisdiction over students. Under the same section there is a right of appeal to the Board of Governors. Under § 15 of the Universities Act the Board of Governors has jurisdiction over parking and traffic.)

3. The Code shall come into force upon being published on at least one occasion in the Gateway or other publication having wide circulation on Campus.

4. The Secretary of the General Faculties Council shall maintain a record of the Code and all amendments thereto. Amendments to the Code shall come into force upon being published on at least one occasion in the Gateway or other publication having wide circulation on Campus.

PART II *Offences*

5. The following activities or conduct or attempts thereat or participation therein are prohibited:

(1) Cheating, plagiarism, fraud, deceit, or other forms of *academic* dishonesty.

(2) Intentionally subjecting any person to physical or mental indignity, injury, or violence.

(3) Disturbing, disrupting, or otherwise interfering with studies, laboratories, lectures, work, or other lawful activities of fellow students or staff.

(4) Intentionally damaging, destroying, or moving without authority the property of the University, or of any student or staff member.

6. All interference on the part of any student with the personal liberty of another or any conduct on the part of any student subjecting another student to any indignity or personal violence is forbidden. No initiation ceremony involving physical violence, hazing, personal indignity, interference with personal liberty or destruction of property may be held within the buildings or on the grounds of the University, such student activities being expressly forbidden.

7. The raiding or unlawful entry of University residences is prohibited.

8. Because the smoke of cigarettes, cigars, and pipes is disturbing and occasionally harmful to some persons, smoking during classes or instructional laboratories (and examinations) is prohibited. (Note: Breach of the above regulation may carry a fine of $25.)

9. Intentionally tampering with or misusing of fire or safety equipment including signs and notices is prohibited.

10. As a safety measure, the roofs of Campus buildings are closed to unauthorized persons. Unauthorized or unjustified occupation is prohibited.

11. Golf practice and similar potentially hazardous activities are prohibited on Campus, except as part of the regular sports program.

12. The outdoor use of public address systems, loudspeakers, bull horns, or sound trucks on the Campus of the University is not permitted without the prior approval in writing of the President or his designee. (City ordinances apply on the peripheral streets.)

13. The use of the name of the University or the crest or coat of arms of the University or of a University club or organization on any publication without the approval of the President or his designee is prohibited. (Note: As a matter of policy the President will not grant such approval to anonymous publications.)

14. University clubs, organizations, or individuals wishing to invite the general public to on-Campus events or to sponsor off-Campus speakers are responsible for so informing the President or his designee, and for making related arrangements including space reservations, protection of persons and property, and payment of any related costs for damages, janitors, commissionaires, or other services. No such sponsoring club, organization or individual should derive financial advantage from such activities. Failure to so inform or to make the aforesaid arrangements is an offence.

15. The unauthorized use of, bringing in, or possession of liquor on University premises including residences is prohibited. Authorization for exceptions to this prohibition may be secured from the President or his designee, and each case will be treated individually on its merits. (Note: For information about liquor regulations in the residences, refer to the Office of the Director of Housing and Food Service. For information about liquor regulations in HUB, apply to the Office of the HUB manager.)

16. All persons are obliged to obey the *lawful* instructions of University officials and employees *acting in the performance of their duties* and are as well obliged to obey all published or posted regulations relating to the use and entry of University buildings and facilities.

PART III *Penalties*

17. (1) In the case of a breach of section 5(1) at the discretion of the Discipline, Law, and Order Hearing any one of the following sanctions may be imposed:

(a) Expulsion
(b) Suspension
(c) Reprimand

(2) In the case of a breach of sections 5(2), 5(3), 5(4), 6, 7, at the discretion of the Discipline, Law, and Order Hearing any one of the following sanctions may be imposed:

(a) Expulsion
(b) Suspension
(c) Fine of not more than $200.00
(d) Reprimand

(3) In the case of a breach of sections 9, 11, at the discretion of the Discipline, Law, and Order Hearing any one of the following sanctions may be imposed:

(a) Fine of not more than $100.00
(b) Reprimand

(4) In the case of a breach of sections 8, 10, 12, 13, 14, 15, at the discretion of the Discipline, Law, and Order Hearing any one of the following sanctions may be imposed:

(a) Fine of not more than $25.00
(b) Reprimand

PART IV *Administrative Requirements*

18. Where in these regulations a discretion to approve or reject an application is given to any person or body, such discretion shall include a right of conditional approval or rejection.

19. All applications for approvals and sanctions required by these regulations, which are made in writing, shall be approved or rejected with reasons assigned therefore in writing. (Note: Individuals wishing to have a decision of an administrative official reviewed should bring their case to the attention of the President.)

261.16 Student Services

261.16.1 STUDENT COUNSELLING SERVICES

Counselling is offered on a confidential basis to both students and prospective students throughout the year.

(1) *Prospective Students.* Vocational counselling is available to any Grade XII student who is planning to attend a university. To arrange an appointment, telephone 432-5205, between 8:30 a.m. and 4:00 p.m. weekdays, or write the Director,

Student Counselling Services, Athabasca Hall, University of Alberta, Edmonton, Alberta T6G 2E8.

(2) *Student in Attendance.* Counselling is available to assist in developing career goals, overcoming difficulties in learning and studying, dealing with personal problems, selecting appropriate fields of study, increasing personal and social effectiveness, and exploring fields of work, career opportunities, and educational programs.

261.16.2 UNIVERSITY HEALTH SERVICE

Comprehensive medical care is provided throughout the year by the University Health Service. A fee is assessed (see §§ 261.8.2 to 261.10.10) to cover pharmaceutical and other ancillary services not paid for by the Alberta Health Care Insurance Commission.

Fully qualified medical and nursing personnel staff the Health Service which is located on the corner of 111 St. and 88 Ave., immediately south of the Law Centre.

Details of the range of services provided may be obtained by contacting the Nursing Supervisor at 432-2612.

261.16.3 STUDENT AWARDS OFFICE

Financial Assistance. Undergraduate students enrolled in Spring and/or Summer Sessions may apply for a loan based on financial need. Applicants must be enrolled in the Spring and/or Summer Sessions in one or more courses leading towards the degree for which they are registered. Applicants must be bonafide residents of Alberta.

Inquiries should be directed to the Students' Finance Board, c/o The Provincial Department of Advanced Education.

The Hooper-Munroe Academic Award. Four prizes of $100 each are offered annually to students graduating from The University of Alberta, Edmonton, with a Bachelor's degree for which the final requirements were completed in the Spring and/or Summer Session. The awards are made to those with the highest averages on the last five full-year courses (or equivalent) taken in the Spring and/or Summer Session at The University of Alberta and counted towards the degree, provided that the grade-point average is not less than 7.0. Selection is made from faculty records. Donor—Spring and Summer Students' Association.

261.16.4 OFFICE OF ADVISER ON NATIVE AFFAIRS

This office has been established to assist in communications between the University and native communities. Assistance and advice is available for students or prospective students from native communities, for individuals or groups in the university who wish to work in or with native communities or organizations, and for native groups or individuals who may wish to gain access to the services and resources of the university. In this regard contact is maintained with the native communities and with Student Counselling, Student Health, Student Awards, organizers of special programs, as well as the student services of individual faculties, and the high school liaison division of the Registrar's Office.

Enquiries may be addressed to: The Adviser on Native Affairs, 124 Athabasca Hall, The University of Alberta, Edmonton, T6G 2G5 (Telephone 432-5677).

261.16.5 DEAN OF STUDENTS

The Dean of Students, 234 Athabasca Hall, is the Senior Administrator in charge of Student Counselling, Student Awards and Student Affairs. The Dean chairs the Council on Student Services which is comprised of representatives from all the services on campus concerned with the welfare of the student body.

261.16.6 STUDENT AFFAIRS

The Office of Student Affairs, 225 Athabasca Hall, is concerned with the general welfare of students, both as individuals and organizations. The Offices of the Director of Student Affairs, the International Student Adviser, the Student Adviser, CIDA Co-ordinator, and Study and Travel Abroad Reference Room (S.T.A.R.R.) are located here. The CUSO Co-ordinator is located at 239 Athabasca Hall. The Student Affairs Office deals with the academic grievances of students and advises them on appeal procedures when appropriate. International, mature and physically disabled students are advised to contact the Office for a wide variety of necessary information and services. Mature student and international student orientations are annual programs of Student Affairs. Authorization for Special Liquor Permits for social functions held on or off campus by student groups and departments are obtained here. It is, also, the contact point for Continuing University Education (C.U.E.) and Single Parents on Campus (S.P.O.C.).

261.16.7 HOUSING AND FOOD SERVICES

Residences. Accommodation is available in the residence halls at Lister for Spring and Summer Session students.

Application forms and information regarding rates etc., will be available from the Housing office after March 15, 1979.

Further information and application forms are available from Housing and Food Services, Lister Hall, 116 Street and 87 Avenue, Edmonton, Alberta T6G 2H6 or phone 432-4281 between 8:30 a.m. and 4:30 p.m. weekdays.

Jurisdiction over the conduct of the student in the University residences during the Spring and Summer Session is vested in the Dean of Students.

A limited amount of accommodation is available in St. Joseph's College. Details can be secured by writing to the College directly.

Family Students' Housing. A limited number of furnished units at Michener Park may also be available on a sub-lease basis for students who prefer such facilities. These units consist of a living room, dinette, kitchen, bathroom and two bedrooms. Each unit has an electric stove, refrigerator, washer and dryer. A listing of available units will be held by the Housing Office and information will be given on request. Any sub-lease contract will be between the present lessee and the summer student. No direct assignment of these units will be made by the Housing Office.

Off-Campus Housing. The Off-Campus Housing Department in S.U.B. maintains a listing of off-campus rooms, apartments and houses. No attempt is made to mail these listings to individual students as they change constantly. Contracts regarding off-campus housing arrangements are to be made directly with the householder.

Food Services. During the Spring and Summer Sessions, food services will be available at Lister Hall and at other food service outlets on campus.

261.16.8 HUB

HUB is a University owned shopping and housing complex, operated by Housing and Food Services.

Three types of accommodation are available for both Spring and Summer students: (a) bachelor units; (b) two bedroom units; (c) four bedroom units. For further information contact the HUB office at 432-2241 or 432-2242.

261.16.9 STUDENT EMPLOYMENT

The Canada Employment Centre, through its Students' Placement Office in the Students' Union Building, is prepared to assist teachers who are seeking employment with school boards. The service has listings of teacher requirements from school boards throughout the whole Province.

261.16.10 RECREATION FACILITIES

During the Spring amd Summer Sessions, and with the cooperation of the Faculty of Physical Education and Recreation and the Spring and Summer Students' Association, the Department of Athletic Services organizes and administers well balanced programs of Sports and Recreational activities. The Spring and Summer Recreation Program offers students a wide variety of instruction, tournament and league play and also the use of our facilities for casual (non-structured) recreation. Co-ed basketball, fastball, slow pitch softball, and volleyball league play, are yearly favorites. Our Instructional Program offers extensive activities including: golf, 3 levels of tennis, squash, and badminton. 3 on 3 basketball is an additional activity to participate in during our Special Sessions. In addition physical fitness programs are available to students for a nominal fee. Casual recreation is also provided in the following facilities: 3 gymnasiums, 2 swimming pools, ice arena, 7 squash, 7 racquetball, and handball courts, weight training room, sauna, several outdoor playing fields, and tennis courts. Lockers and towel service will also be provided during the sessions.

Further information may be obtained from the Department of Athletic Services (Room W1-34, Physical Education and Recreation Centre) between 8:30 a.m. - 12:00 p.m. and 1:00 p.m. - 4:30 p.m.

261.16.11 BOOKSTORE

The University maintains a large and modern bookstore in the Students' Union Building, where prescribed textbooks and supplies of all kinds may be purchased. The Bookstore also stocks a wide range of other items of special interest to students and faculty. Information concerning textbooks for Spring and Summer Sessions can be obtained from the Bookstore. Students are advised to order textbooks as soon as possible. Failure to do so may result in their being unable to obtain prompt delivery at a later date owing to books being temporarily out of stock.

Books may be returned as late as the week following the date of commencement of the course, provided that they are unmarked and are accompanied by the original sales slip or C.O.D. order. Returns of books resulting from withdrawal may be made after this date providing that the books are in an unmarked condition and the student requesting the refund has retained his sales slip, and in addition has obtained a copy of the withdrawal form. This request for return must be made within seven days of the withdrawal.

Mail orders will be accepted only on a Cash-On-Delivery basis. When ordering books by mail from The Bookstore, please state the course name, course number, section number and Session (either Spring *or* Summer).

261.16.12 PARKING REGULATIONS

No free parking is available within the boundaries of the campus. While parking facilities are available for all students who wish to park on campus, a permit must be obtained and affixed to the vehicle.

A Spring and/or Summer Session Parking Permit will entitle the registered vehicle to be parked in those zones designated for Spring or Summer Session students. Parking may also be obtained in other areas, if available, upon application to the Parking Services.

An application for parking will be mailed to students just prior to the commencement of each Session. The application should be completed, and returned in person at the time of arrival on campus, to Parking Services, Art Workshop 1. A permit will then be issued upon payment of the required fee.

Students are advised to familiarize themselves with the Parking and Traffic Regulations, copies of which are available at the Parking Services. Traffic tickets are issued for violations of these regulations.

261.16.13 DAY CARE CENTRES

The Students' Union and Community Day Care Centre located in HUB (8917 - 112 St.) will have several openings for children of Spring and/or Summer Session students from April/80 until September/80. The Centre operates from 7:15 a.m. to 5:30 p.m. Monday to Friday with mid-day meals provided. The staff are fully qualified to work with young children. Because the Centre is Government sponsored, fees are based on family income. Interested students should contact the Day Care Centre at 432-2245.

The University and Community Day Care Centre operates in Windsor Park School, two blocks from campus (8720 - 118 Street). This fully licensed centre may have spaces available for the young children of Summer Session students. Interested parents should direct inquiries to the Director (tel. 403-433-0070).

261.16.14 STUDENT ASSOCIATIONS

For both Spring and Summer Sessions there exists a Spring and Summer Students' Association. This association is supported by the Students' Union. The purpose of the association is to provide student representation on the Special Sessions Committee of the General Faculties Council, sponsor extracurricular activities, foster an appropriate spirit of fraternalism, among members, and to promote the general welfare of the members.

The Spring and Summer Students' Association sponsors the Hooper-Monroe Awards which are given annually to four individual students who have completed a degree in any faculty while in attendance at Spring or Summer Sessions at The University of Alberta. These awards are given in the names of the former Dean of Men, Major Hooper, and the former Dean of Women, Miss I. Munroe.

261.16.15 SPRING AND SUMMER SESSION ABROAD

(1) ANTHR 480-75. *Method and Theory in Prehistoric Archaeology.* ★6 A comprehensive survey of the methods and techniques used in prehistoric archaeology, including auxiliary sciences; conceptual approaches and models used for interpreting archaeological data and cultural history; the relation of explanatory theory in cultural history to anthropology as a whole. Prerequisite: ANTHR 306, or consent of the Department. Note: (A) This course will be given in Montana during the Summer Session only. It will be open to individuals with some background in either cultural anthropology or archaeology. Consent of the Department is required. The course, which is taught as a Field School in the Pryor Mountains of Montana (near Yellowstone), provides a balance between theory and method by placing an equal emphasis upon the collection, analysis, and interpretation of data. In addition to providing experience in reconnaissance and excavation techniques, the course will allow adequate time for labs and seminars. There will also be flintknapping demonstrations and sessions on how to relate this kind of data to the archaeological record. Weekends will be free for excursions to nearby points of interest. Those interested may obtain further information from the Department of Anthropology. (B) A letter of permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will **not** be refunded except in cases of extreme distress. Participants must arrange their own transportation to and from Montana, and are requested to bring their own tents and camping gear. (C) Audit privileges are not extended to students in this course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by May 8, 1981. Registration will be limited to 15 students.

(2) ANTHR 590. *Advanced Physical Anthropology: Methods in the Study of Primate Behavior.* ★6 This course, designed for upper-division undergraduates and graduate students, is offered as a practicum in methods and research design. Elements of research design, especially data gathering and analysis, are discussed and applied in classroom and field situations. The course, which is taught as a field school at Arashiyama West Institute, near Dilley, Texas, provides lectures, labs and field experience in the methods of observing the behavior of monkeys in a non-caged environment. Observational techniques (using various kinds of data sheets, audio and video-tape, and computer keyboard), sampling methods, data preparation and analysis, and the practical difficulties of working with live animals in a free-ranging situation will all be taught, experienced and discussed. There also will be presentations by other primatologists, experienced in various types of research situations (case-studies, colony studies, small enclosure studies, field studies) and visits to two nearby primate research centers. The Arashiyama West Institute Research Ranch is ideal as a training ground in ethological field methods. Systematic observational and data collecting techniques can be easily demonstrated and applied with this well studied and well habituated group. The research facility consists of an electrically fenced 50 acre enclosure in which the Arashiyama West troop of Japanese macaques range freely. This "semi-free ranging" situation combines the best of controlled, captive animal studies and the much more difficult free ranging animal studies. Thus it is excellent for an initial field experience. This group of monkeys has been continuously studied in Texas, and formerly Japan, since 1953. All the animals are individually known and marked for easy identification. Genealogical, management and population data for the group are available. In addition to work at the Institute site in Dilley, instructional and training sessions will be held at the Southwest Regional Foundation for Research and Education in San Antonio, some 70 miles from Dilley. There observational studies of baboons in a 6 acre enclosure are being carried out under the supervision of Dr. A. M. Coelho, and students will have the opportunity of seeing techniques of data collection on computer-linked keyboards in action. Classes will commence on May 4, with several days of classroom instruction and discussion. The class will then move to the field to the primate research centres until the end of May. Students would then attend the meeting of the American Primatological Society from June 2-6 in nearby San Antonio, Texas. Instructors and students will arrange their own transportation to and from Dilley, Texas. Arrangements will be made to meet students at Dilley and drive them to the field site. A camphouse with cooking facilities, running water and flush toilet is provided on the ranch, however, students wishing to sleep in their own tents may do so. On-site transportation will be available and an air-conditioned trailer is provided for daytime classroom use. Students will be asked to share the costs and cooking of their food. A list of required field gear, and any further information should be obtained from the instructor Linda Fedigan, Department of Anthropology, University of Alberta. Note: (A) This course will be given in Texas during the Spring Session only. Those interested may obtain further information from the Department of Anthropology. (B) A letter of Permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will **not** be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in this course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by April 1, 1981. Registration will be limited to 15 students.

(3) ART 339-45/439-45/539-45. *Design Awareness—Study Trip to Europe.* ★6 This course is an overview of the qualities and applications of contemporary industrial, graphic, interior, furniture and architectural design and their influence on the culture and economy of England and West Germany. The course is scheduled for May 4, 1981-June 12, 1981. The first two weeks will be spent in lectures on campus—the following four weeks will be spent in lectures on campus—the following four weeks will be spent in England and West Germany. The course normally requires the submission of two term papers and/or visual reports: one at the conclusion of the two-week lecture period and one upon termination of the travel portion of the course.

Note: (A) This course will be offered in England and West Germany during Spring Session 1981 only. Those interested may obtain further information from Professor Nobuoki Ohtani, Department of Art and Design. (B) A letter of permission will be needed by students applying from other universities to ensure that proper credit will be given. If not enrolled in a degree program apply for Special Student status. The tuition fee will **not** be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in the course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) These courses will be withdrawn unless there is a minimum of 15 students enrolled by the 1st of April, 1981. Total registration will be limited to 20 students.

(4) Class 475-75. *Practical Methods in Classical Archaeology.* ★3 The techniques of excavation and recording in Classical Archaeology. Prerequisite: Consent of the Department. Note: (A) This course will be offered in south Italy during the Summer Session only (July 2-August 13). It will be open to individuals with some background in Classics, Ancient History or Archaeology. This course is taught at a field school near Ruoti in the province of Potenza, at the University's excavation of the villa at San Giovanni. Students taking the course will be trained in (a) distinguishing and excavating archaeological strata; (b) recording the structures and materials found; (c) elementary on-site draftsmanship; (d) classifying and cataloguing artifacts, especially pottery, in the excavation laboratory; (e) techniques of recovering animal and plant remains; (f) archaeological survey of the surrounding countryside. This course will be taught by several members of the excavation staff, and some sessions will be given at a nearby Roman site near Atella. Weekends will be free for excursions to nearby points of interest. Those interested may obtain further information from the Department of Classics. (B) A letter of permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition will **not** be refunded, except in cases of extreme distress. Free accommodation will be provided in the village school at Ruoti, but students will be responsible for bringing their own sleeping bags. There will be a charge of $10.00 per day for meals. Students must make their own way to Potenza where they will be met. Advice on travel, etc., may be obtained from the Department of Classics. (C) Audit privileges are not extended to students in this course. Students who do not wish credit may apply to the Dean for permission to register as Special Students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by May 8, 1981. Registration will be limited to 20 students.

(5) CL TX 417-45. *Selected Topics—Fashion Study Tour.* ★3 A field study of the Canadian fashion industry in its two major centres, Montreal and Toronto, based on visitation and analysis of the various components of the industry, their interrelationships and impact on the Canadian economy. Note: (A) This course will be given during the Spring Session 1981 only. Those interested may obtain a brochure giving further information from the Faculty of Home Economics or may consult Professor Elizabeth Crown. (B) A letter of permission will be needed by students applying from other universities to insure that credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will not be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in this course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 20 students enrolled by March 1, 1981.

(6) INT D 446-75 *A Travel Study Course.* ★6 Intensive interdisciplinary study of Eastern Europe and the Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Summer Session in countries of Eastern Europe and the USSR on a selected basis and includes intensive study in two countries. Prerequisite: INT D 346 or consent of the Division of East European Studies. Pre-session study and preparation. Students register through the Division of East European Studies. Note: (A) This course will be given in Poland and Yugoslavia during the Summer Session 1981 with instruction in English. Those interested may obtain additional information from Professor R. Busch, Division of East European and Soviet Studies. (B) A letter of permission will be needed by students applying from other universities to insure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will **not** be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in overseas courses. Students who do not wish credit can apply to the Dean for permission to register as Special Students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 15 students enrolled by May 8, 1981.

(7) *July 1981: French Immersion in Jonquiere, Quebec.* Considering the success met by the 1979 and 1980 total immersion sessions held in Jonquiere, P.Q., during the month of July, the Department of Advanced Education has encouraged the University of Alberta to offer the program again. Practicing teachers who are teaching in French or French as a second language are encouraged to take this opportunity to live with a French speaking family, to take credit courses in French grammar, Children's Literature in French, French Canadian culture offered by a French Canadian instructor as well as teaching strategies.

The courses are distributed in two programs according to the language background and interests of the participants:

Program I:

FREN 390—French Literature for Children
FR CA 333—Aspects of French Canadian Civilization and Culture
ED CI 497—Conference Seminar: Developing Communication Strategies and Modules (French)

Program II:

FREN 408—Third Year French for Honors Language Students
FR CA 499—Directed Reading in French-Canadian Culture and Civilization
ED CI 498—Conference Seminar: Developing AV Material for Modules to Include Cultural Elements

Each of these courses is worth 3 credits. All courses are offered in French; Dr. P. A. R. Monod is the instructor for the French courses, Gerald Savard gives the French Canadian courses and Drs. D. Petherbridge and M. J. Monod are responsible for the ED CI courses.

Apart from the regular credit courses socio-cultural activities are organized so that teachers will meet as many people from Quebec as possible and get acquainted with their way of life: a night in Montreal, a 2 nights-3 days excursion to Quebec City plus 2 other excursions in the Jonquiere region, visits to museums, "artisanss, chansonniers", theatre and concerts are meant to further the personal experience of each participant with the Quebec culture and way of life.

Course fees are to be paid directly to the Comptroller's Office.

For any further information please contact Dr. P. A. R. Monod, Romance Languages (432-5530) or Dr. M. J. Monod, Secondary Education (432-3658).

261.16.16 1981 LEADERSHIP COURSE FOR PRINCIPALS, TEACHERS AND COUNSELLORS

The Leadership Course will be held at the Alberta School for the Deaf from July 13 to July 17, 1981.

This course is designed to enhance communication skills and the quality of leadership in educational settings. It is intended to serve three major purposes:

1. To provide an opportunity for principals, teachers and counsellors to become informed of new techniques and trends in the field of education;
2. To provide a setting for inter-communication of new concepts and discussion of roles;
3. To discuss cooperatively specific and relevant problems relating to practice.

This is mainly a workshop type of course. The various speakers will contribute much to our thinking but plans for the future, changes we make, the integration of concepts and the ideas we share will largely rest with each individual. We hope that participant's considerable experience and knowledge will be shared in such a way that the activities and views presented by the guest speakers will act as a catalyst to aid us. It is hoped that individuals will also take advantage of informal discussions between administrators, counsellors and teachers. Certain sessions have been jointly planned to encourage and provide this liaison.

Information can be obtained by writing to Dr. Harvey Zingle, Director, Leadership Seminar, 1-135 Education North, University of Alberta, Edmonton, Alberta, T6G 2G5.

262 FACULTY OF ARTS

262.1 Introductory

262.1.1 OFFICERS OF THE FACULTY

Dean of Arts
T. H. WHITE, Ph.D.

Associate Deans
E. REINHOLD, Ph.D.
(Associate Dean, Student Programs and Curriculum)
R. G. MOYLES, Ph.D.
(Associate Dean, Humanities and Fine Arts)
S. M. M. QURESHI, Ph.D.
(Associate Dean, Social Sciences)

Assistant Dean
M. JENDYK, L.U.D.

Assistant Director, Student Programs
R. J. MIDDLEDITCH, B.A.

Administrative Officers
P. A. ROBISON, B.A.
(Assistant to the Dean)
V.A. STOBEE, B.Ed.
(Student Programs)
S. McLEAN, B.A.
(Faculty Secretary)

262.2 Programs

262.2.1 THE DEGREE OF B.A. (GENERAL)

Note: The word 'course' used in the following context, refers to a full-session course or equivalent (two single-term courses).

(1) The B.A. (General) program is designed to enable a student to obtain a diversified education in more than one branch of study, within the limits of a three-year program. A student must secure credit in at least eight Art courses.

a. Duration: A fifteen-course program normally taken in three years. This period may be extended at the student's discretion. Acceleration of the program will only be permitted in exceptional circumstances and with the Dean's approval.

b. Language requirement: Candidates for the B.A. (General) must present credit in a language other than English, either at the senior matriculation level or at university level. In the event of a matriculation deficiency, the language course must be taken in the first year.

c. Residence requirement: A student proceeding towards the B.A. (General) degree must have credit for at least five full-year (or equivalent) University of Alberta courses. These shall normally be the final five courses in the student's program. If the student has fulfilled the five-course requirement before the beginning of the final year of his program, he may apply to the Dean for permission to take one or more of his final five courses elsewhere.

(2) Curriculum:

a. First Year: Five junior courses are required; no more than one course may be selected from each discipline.

b. Compulsory course requirements: One full course equivalent is required from each of the following four areas: Laboratory Science; Fine Arts; Humanities; Social Sciences. (For classification of courses see § 42.3.) Mandatory First Year requirements include a junior English course, a language other than English (where a language deficiency of matriculation exists) and normally, an approved laboratory science course (§ 42.3, para. 1.a.).

Note 1. If a junior laboratory science course is not taken there are a number of senior laboratory

science courses available, but most call for prerequisites.

Note 2. The required junior English course does not satisfy the "Humanities" requirement.

Note 3. Students who entered the BA program prior to September 1979, may continue under the program requirements then in effect (§ 43.1.2 of the 1978-79 Arts and Science calendar), those who interrupt their program for a period of more than two years will be required to meet the new requirements.

c. Subjects of concentration: Two are required: a principal subject chosen from the Fine Arts, Humanities, Social Sciences or Mathematics, and a second subject, which may be chosen from the offerings of either the Faculty of Arts or the Faculty of Science. In the principal subject, a minimum of three courses is required, at least two of which must be senior courses; a maximum of five courses permitted. If a combination of Mathematics and Statistics is chosen, a minimum of four courses is required; two must be at the senior level. In the second subject, a minimum of three courses is required and a maximum of four courses is permitted. The following science combinations are permissible but require a minimum of four courses, two of which must be at the senior level:
Mathematics/Statistics;
Biology/Zoology/Microbiology/Entomology/
Botany/Genetics; Astronomy/Physics;
Chemistry/Biochemistry;
Geography/Cartography/Meteorology.

d. Course selection: Courses offered in the departments and/or subjects listed below will be accepted by the Faculty of Arts as a subject of concentration provided that the requirements stated in the preceding paragraph and the course prerequisite requirements are fulfilled: Anthropology, Art, Chinese, Classics (Ancient History, Art, Classical Literature in Translation), Greek, Latin, Comparative Literature, Drama, Economics, English, Geography, Germanic Languages (German, Scandinavian), History, Japanese, Linguistics, Mathematics, Music, Philosophy, Political Science, Psychology, Religious Studies, Romance Languages (French and/or French Canadian, Italian, Spanish, Romance Linguistics), Slavic Languages (Polish, Russian, Ukrainian), Sociology.

e. Limitations: No more than four courses may be taken for credit in a subject other than the subjects of concentration.

f. Junior courses: Normally, no more than seven courses at the '100' or '200' level may be taken for degree credit. In no case will this limit be extended to permit a student to make up a matriculation deficiency for degree credit, or to include a 'free' option at the junior level.

g. Free options: After completion of all first year requirements, a student may include two courses chosen from outside the Faculties of Arts or Science in his program. In exceptional circumstances a third such course may be taken. (§ 42.3.2) of the Arts and Science calendar for restrictions involved and the Faculty of Arts program office for the list of courses not open to Arts students.)

h. Academic performance: To qualify for a B.A. (General) degree a student must present a grade of 4 or better in a minimum of fourteen courses, not less than a grade of 3 in a fifteenth course (provided this is not a course in either subject of concentration), and a grade point average of at least 5.0 in all courses credited to the degree after the completion of first year requirements.

i. Supplemental examinations: No more than five may be written during the program. No more than two may be written in any academic year, whether for the purpose of obtaining passing marks or of raising the ten course GPA to the required 5.0. Supplemental examinations will not be granted in any course where the weight of the final examination is less than 40%.

262.2.2 THE DEGREE OF B.A. (SPECIAL)

Note: The word 'course' used in the following context refers to a full-session course or equivalent (two single-term courses).

(1) The B.A. (Special) program is designed to enable a student, under the guidance of the department of his choice, to obtain a diversified education in more than one branch of study, but with a greater degree of specialization in a particular field than is available in the General program. A student must secure credit in at least eleven Arts courses. Every registration or change of registration must bear the signature of the departmental advisor concerned indicating the approval of the department.

a. Duration: A twenty course program normally taken in four years (five courses per year).

b. Language requirement: Same as B.A. (General).

c. Residence requirement:

(i) A student proceeding towards the B.A. (Special) degree in the Faculty of Arts must have credit for at least ten full-year (or equivalent) University of Alberta courses.

(ii) When enrolled in the B.A. (Special) program the student shall normally take five full-year courses (or equivalent) during each regular academic year. The student's department may recommend to the Dean exemption from this regulation.

(iii) The final year of the B.A. (Special) program must be taken in one regular academic year in attendance at the University of Alberta campus. The student's department may recommend to the Dean exemption from this regulation. If the student has fulfilled the ten-course requirement prior to the beginning of the final year of his program he may apply to the Dean for permission to take one or more of his final five courses elsewhere.

(2) Curriculum:

a. First Year: Same as B.A. (General).

b. Compulsory course requirements: Same as B.A. (General). (§ 2.b. above).

c. Subjects of concentration: Two are required; a principal subject chosen from the Fine Arts, Humanities, Social Sciences or Mathematics and a second subject which may be chosen from the offerings of either the Faculty of Arts or Faculty of Science. In the principal subject a minimum of five courses is required, at least four of which must be senior courses; a maximum of eight courses is permitted. In the second subject a minimum of four courses is required and a maximum of five permitted. The following science combinations are permissible, but require a minimum of four courses, two of which must be at the senior level:
Mathematics/Statistics;
Biology/Zoology/Microbiology/Entomology/
Botany/Genetics; Astronomy/Physics;
Chemistry/Biochemistry;
Geography/Cartography/Meteorology.

d. Course selection: Courses offered by departments will be accepted by the Faculty of Arts as a subject of concentration provided that the requirements stated in the preceding paragraph and the course prerequisite requirements are fulfilled and departmental approval has been secured. For additional information and advice consult the "Programs of Study" section of the respective departments.

e. Limitations: Same as B.A. (General). (§ 2e. above).

f. Junior courses: Same as B.A. (General). (§ *2f. above).*

g. Free options: After completion of first year requirements, a student, with the recommendation of his department and the consent of the Dean, may include two courses chosen from outside the Faculties of Arts or Science in his program. In exceptional circumstances a third such course may be taken. (§ 42.3.2 of the Arts and Science calendar for restrictions involved and the Faculty of Arst program office for the list of courses not open to Arts students.)
be taken.

h. Academic performance: To qualify for a B.A. (Special) a student must present a grade of 4 or better in a minimum of nineteen courses, no less than 3 in a twentieth course (provided this is not a course in either subject of concentration), and a grade point average of at least 5.0 in the last ten courses of his program.

i. Supplemental examinations: Same as B.A. (General).

262.2.3 THE DEGREE OF B.A. (SPECIAL) IN EAST ASIAN STUDIES

This is a four-year (twenty full-session courses) program under the B.A. (Special) degree category. (See § 262.2.2.) It differs in that the student is required to have three subjects of concentration: East Asian Studies (eight full-session courses), a second discipline (five to eight full-session courses), and a third discipline (three to five full-session courses). Overlap is, however, permitted between East Asian Studies and the second or third concentration. In addition, at least two years of an East Asian language is required. Guidance in the selection of courses is provided by the Chairman, East Asian Studies, c/o Department of History.

262.2.4 CERTIFICATE OF EQUIVALENCE

Applicants holding a University of Alberta B.A. (General) degree, may qualify for a certificate indicating that they have met the requirements of the B.A. (Special) or B.A. (Canadian Studies) degree, by completing five further courses to meet curriculum requirements. This option is not open to degree holders from other universities.

§§ 43.2 to 43.23 of the Faculty of Arts Calendar contain advice offered by the various Arts departments for students selecting courses in their subjects of concentration. Further information may be obtained by consulting members of the department concerned.

For the degree of B.A. with Distinction see § 16.4.3 of the University Regulations and Information for Students calendar.

262.2.5 THE DEGREE OF B.A. (CANADIAN STUDIES)

Note: The word "course" referred to in the following context refers to a full-session course or equivalent (two single-term courses).

This is a four year (twenty course) program, selected under the guidance of the chairman (or designate) of the Committee on Canadian Studies. Conditions governing graduation, supplemental examinations, course load, final year and residence requirements are as for the B.A. (Special) program. (§ 262.2.2.)

Canadian Studies course requirements: A minimum of at least eight courses with Canadian content are required including three CANST courses and five courses from the list of approved Canadian Studies courses, three of which must be Canadian Government, Canadian History, and Canadian Literature.

Specialization requirements: Specialization may be within an established discipline (e.g. English) or across two combined disciplines (e.g. Economics and Political Science) or by special arrangement whereby individual students may propose specializations of a multidisciplinary nature, normally drawn from the list of approved Canadian Studies courses. In a regular program, at least five courses are required and no more than eight courses are permitted, at least three of these must be approved Canadian Studies courses. In the case of a combined specialization, four courses in each discipline are required and at least three of the eight must be approved Canadian Studies courses.

A student specializing within the Humanities must complete at least three courses in the Social Sciences and vice versa.

Students are required to demonstrate a reading knowledge of French by passing a French reading proficiency examination, normally by the end of the second year of studies. Students are also required to take one approved "200 level" English course, one approved laboratory science course, and one Fine Arts course.

Extra faculty options: One extra-faculty course selected from the list of approved Canadian Studies courses, may count towards the Canadian Studies requirement.

For the certificate of equivalence see Section 262.2.4.

262.2.6 THE B.A. (GENERAL) AFTER A THREE-YEAR BACHELOR'S DEGREE (OTHER THAN BACHELOR OF ARTS)

Holders of a recognized three-year Bachelor's degree, other than a Bachelor of Arts, whose programs for the first degree included at least six Arts and Science courses, may qualify for the B.A. General degree by completing nine Arts and Science courses as prescribed by the Faculty of Arts. Those with fewer than six Arts and Science courses will be required to take additional courses.

Students in this program must meet, in their six transfer courses and their nine additional courses, the requirements for the B.A. General degree as stated in § 43.1.2 of the Arts and Science Calendar.

262.2.7 THE B.A. (GENERAL) AFTER A FOUR-YEAR BACHELOR'S DEGREE (OTHER THAN BACHELOR OF ARTS)

Holders of a recognized four-year Bachelor's degree, other than a Bachelor of Arts, whose programs for the first degree included at least eight

Arts and Science courses, may qualify for the B.A. General degree by completing seven Arts and Science courses as prescribed by the Faculty of Arts. Those with fewer than eight Arts and Science courses will be required to take additional courses.

Students in this program must meet, in their eight transfer courses and their seven additional courses, the requirements for the B.A. General degree as stated in § 43.1.2 of the Arts and Science Calendar.

Requirements applicable to both the programs listed above:

(1) A principal subject of concentration in an Arts subject. This may be the same subject as the principal subject of concentration in the first degree.

(2) A second subject of concentration. This may be either an Arts or a Science subject.

(3) One full course equivalent is required from each of the following areas: Laboratory Science, Fine Arts, Humanities, Social Sciences. (For classification of courses see § 42.3, para.1. of the Arts and Science calendar.) Note: The required junior English course does not satisfy the "Humanities" requirement. Students who entered the B.A. program prior to September 1979 may continue under the program requirements then in effect. Those who interrupt the program for a period of more than two years will be required to conform to the new requirements.

(4) English 200 or its equivalent.

(5) A maximum of seven Junior courses in the total program (including both transfer courses and courses taken in the Faculty of Arts and Science). However, the Dean may approve up to two and, in rare cases, three extra Junior courses if, in his judgment, these are deemed essential in establishing the new program.

Notes applicable to both programs listed above:

(1) These regulations apply only to the holder of a Bachelor's degree, or its equivalent.

(2) The extra-Faculty free options open to student in the regular B.A. programs are not available in the "B.A. after" programs.

(3) A student taking a B.A. after a B.Sc. degree will not normally be permitted to take further courses in the Faculty of Science.

(4) The B.A. (Special) after another three or four year baccalaureate degree, requires an additional year of study (five full-session courses) beyond the requirements for the General degree. These courses will be taken under the direction of the department in which the principal subject of concentration is taken. All requirements for the B.A. (Special) as stated in § 262.2.2 must be met.

Note: Students seeking a third Bachelor's degree will be required to complete the full 15-course requirement for the B.A. General degree.

262.2.8 B.F.A. OR B.MUS. AFTER A PREVIOUS BACHELOR'S DEGREE

The requirement for a B.F.A. (Art and Design) or a B.F.A. (Drama) or B.Mus. after a previous Bachelor's degree, will normally be three years (fifteen full-session courses or equivalent), but in no case will less than twelve full courses or equivalent be required. The program will be established by the Faculty of Arts.

263 BUSINESS ADMINISTRATION AND COMMERCE

263.1 Introductory

263.1.1 Officers of the Faculty

Dean
R. S. Smith, Ph.D.

Associate Dean (Undergraduate Programs)
M. J. VERTIGAN, Ph.D.

Associate Dean (Graduate Programs)
R. E. SCHNECK, Ph.D.

263.1.2 GENERAL INFORMATION

The Faculty of Business Administration and Commerce offers Spring Session, Summer Session, and On-Campus Evening Degree Credit courses acceptable for credit in the programs leading to the degrees of Bachelor of Commerce (B.Com.) and Master of Business Administration (M.B.A.).

263.2. Programs

263.2.1 THE B.COM. PROGRAM

(1) *Purpose*—The Bachelor of Commerce program seeks to provide the student with a broad background in the different areas of business as well as related fields in the humanities and social sciences. The business world and its environment have changed enormously in the last twenty years and will change at an even faster pace in the next twenty. In this trend questions about the environment will become increasingly important. No school of business can possibly teach the solution to problems which will arise several years from now. A school should, therefore, seek to provide a basis for effective self-learning through actual experience by teaching the broad underlying fields of knowledge which are basic to business. The emphasis is upon the development of a comprehensive analytical framework within which various organizational problems can be analyzed.

(2) The B.Com. program normally involves four academic years of post-secondary study.

(3) *B.Com. Program After Approved Degree*—Normally the holder of an approved degree may qualify for the Bachelor of Commerce degree upon completion of twenty selected half-year courses.

(4) A full description of the B.Com. programs is contained in the Faculty of Business Administration and Commerce section of the University Calendar. This publication, as well as other information is available from the Student Records Office in the Faculty.

263.2.2 GRADUATE STUDY

The Master of Business Administration program is designed for students who desire a broad

preparation for management positions in industry and government. Its emphasis is upon breadth of training rather than specialization. The focus of the M.B.A. program is on the roles of the manager and the administrator. Although functional areas of business such as finance, marketing, and management science are important elements in the program, they are only a part of and subsidiary to the primary purpose of the program, which is education for general managerial and administrative responsibilities.

The program provides professional training in business administration for outstanding students regardless of their undergraduate field of study.

For further information please contact:

Dr. R. E. Schneck
Associate Dean, Graduate Programs
Faculty of Business Administration
and Commerce
The University of Alberta
Edmonton, Alberta
T6G 2G1

264 FACULTY OF EDUCATION

264.1 Introductory

264.1.1 OFFICERS OF THE FACULTY

Dean
W. H. WORTH, Ed.D.

Associate Dean
(Planning and Development)
R. S. PATTERSON, Ph.D.

Associate Dean
(Student Services)
M. P. BROWNE, Ph.D.

Assistant Deans
C. A. NORMAN, Ph.D. (Admission)
A. PEARSON, Ph.D. (Practicum)

264.1.2 GENERAL INFORMATION

Courses included in the Special Sessions Calendar that are offered by the Faculty of Education are credit courses that may be applied to the B.Ed. Degree, and Graduate Diploma. These courses may also apply to graduate degrees offered by the Faculty of Graduate Studies and Research.

In order for courses to be applied to programs, registrations must be approved by either the Faculty of Education or the Faculty of Graduate Studies and Research.

Course Load

a. Students in undergraduate programs are restricted to 3 credits in each term of the Spring and Summer Session. Students with an established G.P.A. of 7.5 on the last 30 credits of work completed as a student in the Faculty of Education may do up to 6 credits each term of the Spring or Summer Session to a maximum of 18 credits for the combined Spring and Summer Sessions.

b. Diploma students are restricted to 3 credits each term of the Spring or Summer Session except by *written* permission of their respective Department Chairman. Attach your written consent to your registration form.

c. Special and Visiting Students are restricted to 3 credits each term of the Spring or Summer Session, regardless of academic average.

[Students who submit registration forms which do not conform to these regulations will have the extra courses deleted before the registration is processed.]

264.2 Programs

Continuing students in undergraduate programs should consult the Faculty Calendar for appropriate program information. Where questions arise about the suitability of a course or a program, the student should contact the Office of the Associate Dean (Student Services). Inquiries will be dealt with by a Faculty Record Clerk. Where a course does not fit the program, permission to register will be denied.

Students on the old program who have completed less than 60 credits can expect to have their programs modified or be transferred to the new B.Ed. program in order to accommodate a longer student teaching experience.

Students may not register in Spring and Summer courses if the courses selected interfere with the sequencing of courses as they relate to the education practicum experience provided by the Faculty.

No education practicum courses may be taken in the Spring Session except by special permission under extraordinary circumstances. Requests for education practicum courses must be approved by the Office of the Associate Dean, Student Services, before a request may be submitted to the Field Experience Office.

Elementary Education students should not enrol in any free options in Special Sessions nor use any program slots reserved for practicum.

Students enrolled in the elementary generalist program (1979 admissions) should not enrol in Education courses in Special Sessions.

WARNING: Each student is responsible for the accuracy of his/her own program. You must insure that any course(s) taken in Spring/Summer does not interfere with your professional or senior terms. If you take inappropriate or out of sequence courses you may lose credit for those courses. If you have any questions be sure to check with your record clerk in Room 833 Ed South.

265 FACULTY OF HOME ECONOMICS

265.1 Introductory

265.1.1 OFFICERS OF THE FACULTY

Professor and Dean
D. BADIR, M.Sc.

Associate Professor and Associate Dean
T. DENNIS

Professor and Chairman, Foods and Nutrition
Z. HAWRYSH, Ph.D.

Associate Professor and Chairman, Clothing and Textiles
E. CROWN, Ph.D.

Associate Professor and Chairman, Family Studies
D. KIEREN, Ph.D.

265.1.2 GENERAL INFORMATION

The Faculty offers three four-year programs of study. The first year may be taken at the University of Calgary, The University of Lethbridge, or at one of the following colleges: Red Deer, Grande Prairie, Medicine Hat or Camrose Lutheran College (see the Calendar of the appropriate university or college).

Students may enrol in one of the following programs of study: *family studies, foods and nutrition, clothing and textiles*. The programs contain both prescribed courses and options and they are designed to provide the student with a foundation in arts, science and home economics.

In the Spring Session, Summer Session, On-Campus Evening Degree Credit Courses and the Evening Credit Program (Off-Campus), the Faculty of Home Economics offers courses acceptable for credit in the programs leading to the degree of Bachelor of Science in Home Economics. Students who are planning to begin work in the Faculty of Home Economics in the 1979-80 session in either the Evening Credit Program (Off-Campus) or by participating in the On-Campus Evening Degree Credit Courses offered in Edmonton, should contact the office of the Administrative Assistant before registering.

For further information please consult the Faculty of Home Economics calendar or the Faculty of Graduate Studies and Research Calendar.

265.2 Programs

265.2.1 ACADEMIC STANDINGS AND GRADUATION FOR THE FOUR YEAR B.Sc. PROGRAM

(1) Promotion from year to year is made by the Faculty Council upon recommendation of the Faculty's Student Promotions Committee.

(2) In general, promotion will depend upon satisfactory performance in the preceding year. Students whose performance is unsatisfactory will be referred to the Dean of the Faculty.

(3) No supplemental examinations are held for Spring and Summer Session courses.

265.2.2 CLOTHING AND TEXTILES PROGRAM

First Year

CL TX 200 (Design in Everyday Living) (half course)
CL TX 203 (Clothing Construction and Flat Pattern Design) (half course) (see NOTE A)
Art H 250/251
Chemistry 250
English 210
One Full course from group I

NOTE A: For students with experience in clothing construction and pattern making, a placement test may be written to assess level of competence. If students have adequate competency, they may substitute one half-course for CL TX 203. This test may be written prior to or during in-person registration.

Second Year

CL TX 307 (Experimental Techniques in Clothing Construction) (half course)
CL TX 309 (Textile Science I) (half course)
CL TX 310 (Textile Science II) (half course)
One half course from Group II
Two full courses from Group I
Arts or Science Option

Third Year

FAM 359 (Presentation and Communication) (half course)
Three half courses from Group II
Senior Option
Option
Senior Arts or Science Option or Business Administration and Commerce Option

Fourth Year

Two Senior Options
Four half courses from Groups II and III
Approved Option

Group I includes the following courses:
Sociology 202
Psychology 260 and 261
Chemistry 200
Jr. Physics and/or Jr. Math (including Statistics)
Economics 201/202 or 306/307
History 200 or 201
Art 231

Group II includes the following courses:
CL TX 300 (Clothing and the Consumer)
CL TX 302 (Home Design)
CL TX 304 (History of Interior Design and Furniture)
CL TX 305 (Textile Design)
CL TX 306 (Housing)
CL TX 401 (Flat Pattern Design)
CL TX 403 (Historic Costume)
CL TX 404 (Historic Textiles)
CL TX 405 (Advanced Textile Design)
CL TX 407 (Tailoring)
CL TX 410 (Consumer Textiles)
CL TX 411 (Advanced Textiles)
CL TX 412 (Socio-cultural Aspects of Clothing)
CL TX 416 (Economics of Clothing and Textiles)
CL TX 417 (Selected Topics)
CL TX 419 (Fabric Geometry)
CL TX 420 (The Fashion Industry)

Group III includes the following courses:
CL TX 502 (Independent Study I)
CL TX 503 (Independent Study II)
CL TX 504 (Textile Conservation)
CL TX 506 (Practicum in Selected Areas)
CL TX 507 (Historic Resources Internship)
CL TX 510 (Current Issues in Clothing and Textiles I)
CL TX 511 (Current Issues in Clothing and Textiles II)
CL TX 512 (Current Issues in Clothing and Textiles III)
CL TX 514 (Personality and Clothing)
CL TX 517 (Selected Topics)
CL TX 518 (Textiles Seminar)

265.2.3 FAMILY STUDIES PROGRAM

First Year

FAM 241 (Family Development) (half course)
FAM 340 (Management of Family Resources) (half course)
BIOL 198 and ½ Jr. BIOL Option or CHEM 250
PSYCO 260, PSYCO 261
SOC 202
2 half Open Options

Second Year

FAM 343 (Child Development) (half course)
FAM 359 (Presentation and Communication) (half course)
2 half FD NU Options
2 half CL TX Options
2 half Open Options
ECON 201, 202 or 306, 307

Third Year

FAM 440 (Consumer Problems) (half course)
FAM 443 (Issues in Family Life Education) (half course)
FAM 448 (Family Communication) (half course)
STAT 241 or PSYCO 309 or SOC 313
5 half Open Options
1 half Option from Group 1

Fourth Year

FAM 444 (Methods in Family Services) (half course)
FAM 445 (Practicum in Family Services)
2 half Options from Group II
SOC 477, SOC 478
3 half Open Options

Group I includes the following courses:
FAM 346, 347, 350, 447

Group II includes the following courses:
FAM 442, 449, 450, 460, *540, *541, *543, *551, *553, *559

*with permission

265.2.4 FOODS AND NUTRITION PROGRAM

First Year

Biology 130 or two of Biology 296, 297, 298, 299
Chemistry 200
Chemistry 250
Arts Option (see Notes A, B, C)
Option (see Notes A, C)

Second Year

FD NU 320 (Basic Foods I) (half course)
FD NU 321 (Basic Foods II) (half course)
FD NU 323 (Socio-Cultural Aspects of Food) (half course)
BIOCHEM 300
MICRO 315 and 365
Three half Options (see Notes A, B, C)

Third Year

FD NU 464
FD NU 465
2 senior half courses in Foods and Nutrition (see Note C)
CHEM 312 or Option (see Note C)
PHYSIOL 410
FAM 359
Half course Option (see Note C)

Fourth Year

Four senior half courses in Foods or Nutrition (see Note D)
Two half courses or equivalent in Computing Science and/or Statistics
Option (see Note C)
Senior Arts Option

Note A: Students who have not completed Mathematics 30 must substitute Mathematics 100 for the Option.

Note B: Students should note that the prerequisites for FAM 359 are FAM 350 or a half course in Sociology or Psychology and at least two half courses in the student's major. Students proceeding to a dietetic internship are advised to take FD NU 429.

Note C: To qualify for entry into an approved Generalist dietetic internship, the following courses must be taken: at least one half course in the Humanities (e.g., Languages, History, Philosophy); at least one half course in the social sciences (e.g., Sociology, Psychology, Economics, Anthropology); at least three half courses in administration (e.g., Organization Theory, Industrial Relations and Accounting); Foods and Nutrition 425 and Foods and Nutrition 461.

Note D: Includes 400 and 500 level Household Economics courses or Food Science courses.

265.2.5 THE B.Sc. IN HOME ECONOMICS AFTER APPROVED DEGREES

(1) Holders of an approved degree may qualify for the B.Sc. (H.Ec.) degree upon completion of a minimum of ten full (or equivalent) prescribed courses. All curriculum requirements in the Home Economics program of their choice must be met. Students must pass all courses with a grade of at least 4, and must obtain a GPA of 5.0 or better in all courses credited towards the B.Sc. (H.Ec.) after an approved degree. The residence requirements must be met.

(2) Holders of two or more approved bachelor's degrees may qualify for the B.Sc. (H.Ec.) degree upon completion of a minimum of 15 full (or equivalent) prescribed courses. The residence requirements must be met.

265.2.6 INTER-DISCIPLINARY B.Sc. PROGRAM IN FOOD SCIENCE

For details of the program see § 33.2 of the "Faculty of Agriculture and Forestry Calendar."

266 FACULTY OF LIBRARY SCIENCE

266.1 Introductory

266.1.1 OFFICERS OF THE FACULTY

Professor and Dean

W. J. KURMEY, B.Sc., A.M.(L.S.)

266.1.2 GENERAL INFORMATION

The Faculty of Library Science, the only professional library school in the prairie provinces, offers the Master of Library Science degree.

The first classes in a Bachelor of Library Science program began in 1968. In 1970 the B.L.S. program was accredited by the Committee on Accreditation of the American Library Association and was thus recognized by the American and Canadian Library Associations as meeting library education standards.

In 1971 the Faculty initiated a Master of Library Science program for which the B.L.S. program was the qualifying year. In 1976, in keeping with the Canadian pattern of education for librarianship, the B.L.S. was discontinued, and the present two-year M.L.S. program was instituted.

As the first professional degree, the M.L.S. represents a program designed to develop the

knowledge, understanding, attitudes, and skills that will prepare graduates for positions of responsibility in school, public, academic, and special libraries.

The M.L.S. program was accredited by the American Library Association in January, 1979.

266.2 *The Degree of M.L.S.*

A full-time student who is registered for the M.L.S. degree program will normally be able to complete degree requirements in two years. During the qualifying year students will be required to take five full courses or their equivalent (ten half-courses). During the candidacy year students will be required to take the equivalent of ten half-courses, and spend a minimum of two terms in full-time attendance. Students may, with approval, include up to two full courses in a faculty other than the Faculty of Library Science. The program includes provision for both a thesis and non-thesis option.

Credit for courses taken elsewhere may be granted as advanced credit by the Dean of the Faculty of Graduate Studies and Research on the recommendation of the Faculty of Library Science provided that the courses have not been counted towards a previous degree or diploma. (Please note a special provision for applicants with the B.L.S. degree.)

Inquiries regarding program and course details and financial assistance other than University scholarships should be made to the Dean of the Faculty of Library Science. Inquiries about University scholarships should be made to the Student Awards Office.

267 FACULTY OF PHYSICAL EDUCATION AND RECREATION

267.1 *Introductory*

267.1.1 OFFICERS OF THE FACULTY

Professor and Dean
H. J. McLACHLIN, Ph.D.

Professor and Associate Dean
R. B. J. MACNAB, Ph.D.

267.1.2 GENERAL INFORMATION

The Faculty offers four-year programs leading to the degrees of Bachelor of Physical Education and Bachelor of Arts in Recreation Administration. In addition to these two programs, the Faculty provides instruction in teaching methods in dance, health and physical education for students in the Faculty of Education.

Students holding the degree of B.P.E. or its equivalent may undertake graduate study in physical education leading to the degrees of Master of Arts, Master of Science and Doctor of Philosophy. The Calendar of the Faculty of Graduate Studies and Research should be consulted for further details.

267.2 *Programs*

267.2.1 THE DEGREE OF B.P.E.

(1) To be granted the B.P.E. degree or the B.A. degree in Recreation Administration, a student must obtain a passing grade or better in all courses in the final two years of the respective degree program, obtaining a grade-point average of at least 5.0.

(2) A student will not be allowed to write more than five supplement examinations in full courses, or the equivalent, for the purpose of obtaining passing grades or of raising his average to the required level.

(3) A student will not be allowed to write more than two supplemental examinations in full courses, or equivalent, in any year. (This regulation may, in exceptional circumstances, be relaxed for first-year students).

(4) A student who repeats a year will be granted no supplemental privileges in the courses taken that year and must pass all courses in the repeated year with a grade-point average of at least 5.0 to be allowed to continue.

(5) The privilege of repeating a year will be granted to a student not more than once during his candidacy for a degree in this Faculty unless by special permission of the Dean.

NOTE: STUDENTS ENTERING THE PROGRAM AFTER SEPTEMBER 1, 1973 ARE REQUIRED TO COMPLETE THE FOLLOWING PROGRAM. STUDENTS WHO HAVE COMPLETED SOME WORK TOWARDS THE B.P.E. DEGREE PRIOR TO SEPTEMBER 1, 1973 MUST CONSULT WITH A FACULTY REPRESENTATIVE BEFORE PROCEEDING WITH WORK ON THEIR PROGRAM.

First Year

**Arts or Science Option
Arts or Science Option
Science Option
Science Option
P ED 200 (Introduction to Physical Education)
P ED 201 (Biomechanics)
P ED 203 (Kinesiology I)
P ED 204 (Structural Anatomy)
P ED 205 (Kinesiology II)
P ED 206 (Functional Anatomy)
P ED Option (Group B)
P ED Option (Group B)
**Physics 203 must be taken in first term if Physics 20 has not been successfully completed.

Second Year

Non-Department Option
Physiology 260
P ED 202 (Movement Analysis)
P ED 207 (Growth and Development)
P ED 208 (Measurement and Evaluation)
P ED 209 (Projects)
Core Course in a Route
Core Course in a Route
Core Course in a Route
Physical Education Option

Third Year

Non-Department Option
P ED 300 (Human Performance)
P ED 302 (Physiology of Exercise)
P ED 303 (Psychology of Sport)
†P ED 309 (Project) or P ED (Group A) Option
Route Related Course
Route Related Course
Route Related Course
Physical Education Option

Option
Option

Fourth Year

P ED 400 (Persistent Problems)
P ED 401 (Sociology of Sport)
P ED 402 (History of Sport and Physical Education)
†P ED 409 (Project) or P ED (Group A) Option
Route Related Course
Route Related Course
Route Related Course
Physical Education Option
Physical Education Option
Option
Option
Option
†Students must enroll in either P ED 309 or P ED 409.

Six routes or areas of concentration are offered—Adapted Physical Education, Administration, Coaching, Dance, Outdoor Education, Athletic Training and Conditioning.

In the second year each student shall take a minimum of three core courses from the available routes. Subsequently, a student shall elect to major in a minimum of one route. A major is comprised of the core course and six route related courses. The coaching route is comprised of one core course and seven route related courses.

Students who choose not to take a seven-course route concentration may take the required three core courses plus a minimum of four route-related courses in one area and choose the other two route-related courses from required Physical Education courses in another route area.

267.2.2 THE DEGREE OF B.A. IN RECREATION ADMINISTRATION

First Year

REC 255 *or* REC 451
REC 257
Activity Option
English *or* Philosophy *or* History
Economics *or* Political Science
Psychology 260 *or* Education Psychology 269
Psychology 261 *or* Education Psychology 271
*Sociology 202
Junior Science (Biology, Geography *or* other approved science Option)
Pattern foundation *or* approved Option

Second Year

REC 301
REC 345
REC 350
REC 351
REC 371
Activity Option
Accounting 307
Pattern Foundation
Pattern Foundation
*SOC 311 *or*
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option

Third Year

REC 455
REC 457
REC 465
REC 469
*SOC 311 *or*
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option
REC Pattern Professional
REC Pattern Professional
Pattern foundation
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option

Fourth Year

REC 458
REC Pattern Professional *or* Pattern Foundation
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option
Pattern Foundation *or* Pattern Related Option
Pattern Related Option *or* Approved Option
Pattern Related Option *or* Approved Option
Pattern Related Option *or* Approved Option
Pattern Related Option *or* Approved Option
*Full session courses—the equivalent of two single-term courses must be taken.

268 FACULTY OF SCIENCE

268.1 Introductory

268.1.1 OFFICERS OF THE FACULTY

Dean

K. B. NEWBOUND, Ph.D.

Associate Deans

D. D. BEATTY, Ph.D.
J. KUSPIRA, Ph.D.
J. L. MAHRT, Ph.D.

Assistant to the Dean

W. E. RANDALL

268.1.2 GENERAL INFORMATION

The Faculty of Science offers Spring Session, Summer Session, On-Campus Evening Degree Credit Courses and Evening Credit Program (Off-Campus) courses acceptable for credit in the general programs leading to the degree of Bachelor of Science (B.Sc.). Students who are planning to begin work in the Faculty of Science in the 1980-81 Winter Session in either the Evening Credit Program (Off-Campus) or by participating in the On-Campus Evening Degree Credit Courses offered in Edmonton, should contact the office of the Dean before registering.

268.2 Programs

268.2.1 GENERAL PROGRAMS

General programs in the Faculty of Science are designed to enable the student to obtain a diversified education in more than one branch of study within the limits of a three-year program. The basic outline of the program is as follows:

First Year: Arts option; three Science courses; one option.

Second Year: An Arts course; three Science courses; one Arts or Science option.

Third Year: An Arts course; two Science courses; two Arts or Science options.

Selection of Courses: The following regulations govern General programs:

(1) In each year, a student's program must be approved by the Dean or his or her designee. Students in PreDental and Pre-Medical programs must consult the Dean with respect to selection of courses in each year of the program. Other General program students must consult either the Dean or an advisor in the Department representing the

principal subject of concentration regarding selection of courses in each year of the program.

(2) To obtain a General B.Sc. degree a student must pass 15 full-session courses or the equivalent. Of these at least 8, and no more than 12 full-session courses or the equivalent must be Science courses, and at least 3, and no more than 7 full-session courses or the equivalent, must be Arts courses.

(3) Each student must take at least 4 and no more than 6 full-session courses or the equivalent, in the principal subject of concentration which must be one of the Sciences, and a minimum of 3 and a maximum of 4 full-session courses or the equivalent, in a second subject of concentration which must also be one of the Sciences. In each subject of concentration, no more than two full-session courses or the equivalent can be at the junior level.

(4) Normally no more than 7 full-session junior courses or the equivalent are permitted in the General program.

(5) Up to the equivalent of one full-session course approved by the Dean may be taken from Faculties other than Arts and Science. Such courses are considered as "approved options" and are not to be included either as part of the minimum of three full-session courses or the equivalent in Arts or in the minimum of eight full-session courses or the equivalent in Science. Under certain circumstances a student may be permitted by the Dean to take up to the equivalent of one additional full-session non-Arts and non-Science course in subjects closely related to those offered by the Faculty of Science, e.g., Animal Science, Plant Science and Soil Science.

Academic Standings and Graduation: The following regulations govern General programs:

(1) To obtain a B.Sc. General degree, a grade-point average of at least 5.5 must be attained on the last 10 full-session courses or the equivalent credited to the degree. Moreover, a grade-point average of at least 5.5 must be attained for all courses in the principal subject of concentration.

(2) A grade of 3 may be accepted as a passing grade in no more than one full course or two half courses and then only from among the last five full-session courses or the equivalent credited to the degree. Moreover, such credit may not be obtained in courses comprising the principal or second subject of concentration.

(3) The Dean may permit a student to proceed to a degree over a longer period than three years, or to meet the requirements in a shorter time by attending Spring and/or Summer Sessions or by taking extra courses during the Winter Session.

(4) B.Sc. General degrees with Distinction are awarded when students achieve a grade-point average of 7.5 or higher over the last 10 full-session courses or the equivalent, provided the student was enrolled in a normal academic load (five full-session courses or the equivalent) during the Winter Sessions of the last two years.

(5) A student transferring to the Faculty of Science with advanced standing will be required to complete at least 5 (normally the last 5) full-session courses or the equivalent at The University of Alberta.

The following sections contain advice offered by the various Science departments to students selecting courses in their subjects of concentration. Further information may be obtained by consulting members of the Department concerned.

268.2.2 SPECIAL CERTIFICATES

Students who have received a B.Sc. degree and who meet the requirements for one of the Specialization Programs or for one of the Honors Programs by the addition of a minimum of five full courses or the equivalent will be awarded a Special Certificate to recognize the additional qualification. The specific requirements for this Certificate are determined for each student by the appropriate Department and the Dean.

268.2.3 THE B.SC. AFTER A PREVIOUS DEGREE

Requirements for B.Sc. after B.Ed. Holders of the B.Ed. degree, whose programs include thirteen Arts and Science courses, may qualify for the B.Sc. degree in the General Program by completing "at least" six full-session courses or the equivalent; and attaining a grade-point average of 5.5 in these courses. Those with fewer than thirteen Arts and Science courses will be required to take additional courses.

Students proposing to obtain the General B.Sc. in this manner will be expected to select their courses in conformity with the requirements of the General program outlined in § 268.2.1. To receive the B.Sc. General degree, the student must complete at least ten full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs. At least six of these full-session courses must be senior ones. If a student holding a B.Ed. degree wishes to obtain an Honors or Specialization degree in the Faculty of Science, the student must complete at least eleven full-session courses or the equivalent and meet the requirements of the four-year program as specified by the Department in which the student is majoring. The student must complete at least fourteen full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs.

Requirements for B.Sc. after B.A. Holders of the B.A. General degree may qualify for the B.Sc. General degree by completing at least nine full-session courses or the equivalent and attaining a grade-point average of at least 5.5 in these courses. Students proposing to obtain the General B.Sc. in this manner will be expected to select courses in conformity with the requirements of the General program outlined in § 268.2.1. To receive the B.Sc. General degree, the student must complete at least twelve full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs. Students holding a B.A. General degree wishing to obtain an Honors or Specialization in the Faculty of Science must complete at least fourteen full-session courses or the equivalent and meet the requirements of the four-year program as specified by the Department in which the student is majoring. The student must complete at least fifteen full-session courses or the equivalent in the subjects of the Faculty of Science in the two degree programs.

Students wishing to obtain a B.Sc. after a four-year B.A. must consult the Dean.

Requirements for B.Sc. after Engineering Degree. The requirements are basically identical to those for a B.Sc. after B.Ed.

269 FACULTY OF GRADUATE STUDIES AND RESEARCH

269.1 Introductory

269.1.1 OFFICERS OF THE FACULTY

Dean
J. FORSTER, Ph.D.

Associate Deans
W. D. GAINER, Ph.D.
S. B. WOODS, Ph.D.

Graduate Registrar
H. R. HAWES, B.Sc.

Research Grants Officer
G. A. HOLMES, B.Com.

269.1.2 GENERAL INFORMATION

The Faculty of Graduate Studies and Research administers programs leading to a variety of graduate degrees and postgraduate diplomas. Graduates who have not been accepted as candidates for degrees may be considered as "qualifying" or "probationary" graduate students if they are eligible and desirous of seeking admission to candidacy at a later date. "Special" graduate students and "Exchange" graduate students may also be accepted in the Faculty.

Students proposing to do graduate work in the Spring or Summer Sessions should familiarize themselves with the regulations and procedures set forth in the Calendar of the Faculty of Graduate Studies and Research, which may be obtained from the Faculty Office, Room 2-8, University Hall. A few of the more important academic regulations are given in § 269.2 below.

269.2 Academic Regulations

269.2.1 ADMISSION

Application for admission to the Faculty must be submitted on forms supplied by the Dean. A graduate of another university must arrange with the Registrar of that institution to forward two transcripts of his academic record to the Dean prior to the deadline dates for Spring Session, Summer Session, On Campus Evening Degree Credit Courses or Evening Credit Program (Off-Campus) specified in the Academic Schedule (§§ 261.2, 261.3 and 261.4). If applications are received after these dates the Faculty gives no assurance that they can be processed in time to permit registration in the Session desired. The Dean may require the applicant to furnish an official description of the content of the courses listed on the transcripts.

269.2.2 REGISTRATION

An applicant who has been accepted by the Faculty as a qualifying graduate student, a probationary graduate student, a candidate for a master's degree, or a provisional candidate for a doctor's degree, must:

(1) before completing registration forms, consult with the chairman of the department responsible for his graduate study program regarding his course of studies in the Spring Session, Summer Session, On-Campus Evening Degree Credit Course or Evening Credit Program (Off-Campus). The department concerned will submit a program form to the Faculty of Graduate Studies and Research.

(2) register not later than the dates specified in the Academic Schedule (§§ 261.2, 261.3 and 261.4) if he proposes to work on his program in the Spring Session, Summer Session, On-Campus Evening Degree Credit Courses or Evening Credit Program (Off-Campus).

(3) maintain continuous registration during his program by registering once a year. This registration entitles him to the use of university facilities and to assistance from his supervisors for a 12-month period. Registration during the final year of the program permits the student to graduate at either of the two following convocations.

A student who fails to maintain continuous registration will be considered to have withdrawn from his program. If he wishes to resume studies on the program, he must apply for readmission to the Faculty of Graduate Studies and Research and have his program reassessed in terms of the regulations in force at the time of application.

269.2.3 ORAL EXAMINATION AND CONVOCATION

Unless otherwise specified, each candidate must pass a final oral examination following the submission of the thesis to the Examining Committee. The finished thesis must be submitted to the examining committee at least two weeks before the oral examination.

In order to obtain his degree at the earliest Convocation following the completion of his thesis, the student must have submitted the unbound copies of his thesis to the Faculty Office on or before a date set by the Faculty to allow enough time for the student's name to appear in the Convocation program. The schedule of deadline dates is available from the Faculty Office.

270 FACULTÉ SAINT-JEAN

270.1 Introduction

270.1.1 PERSONNEL ACADÉMIQUE

Professeur et doyen
G. MORCOS, Dipl. E.N.S. de Saint-Cloud
D.U. Paris

Professeurs Agrégés
T. BILODEAU, Lic.Ph. (Philosophie)
E. V. BLACKBURN, Ph.D. (Chimie)

270.1 Introductory

270.1.1 MEMBERS OF THE FACULTÉ

Professor and Dean
G. MORCOS, Dipl. E.N.S. de Saint-Cloud D.U. Paris

Associate Professors
T. BILODEAU, Lic.Ph. (Philosophy)
E. V. BLACKBURN, Ph.D. (Chemistry)

G. CADRIN, Doct. (Français)
S. T. CAREY, Ph.D. (Psychologie)
J. COLSON, Doct. (Linguistique)
D. DESMARAIS, M.Sc. (Mathématiques, Physique)
J. FORTIER, M.A. (Lettres Classiques)
L. GODBOUT, L.Ph. (Philosophie)
H. HÉBERT, M.E.P. (Education Physique)
M. KAPETANOVICH, D.U. (Français)
R. A. PITTS, Ph.D. (Sociologie)
S. SHERIDAN, Ph.D. (Biologie)

Professeurs Adjoints
G. ALLAIRE, M.A. (Histoire)
E. A. AUNGER, Ph.D. (Science Politique/Economie)
G. GUENETTE, M.A. (Français)
A. LA FRANCE, B.A., B.Ed., M.Mus. (Musique)
F. LEVASSEUR-OUIMET, B.Ed., M.A. (Français)
L. MacCALLUM, M.A. (Anglais)

Faculty Service Officer
S. LANDRY, B.Ed.

Bibliothécaire
G. E. DUROCHER, M.Lib.

AUTRES MEMBRES DU CONSEIL ACADEMIQUE

Président de l'Université
H. E. GUNNING, Ph.D., D.Sc., F.R.S.C.

Représentant de la Faculté des Lettres
K. KROTKI, Ph.D., S.R.C.
(J. R. WILSON, Ph.D., substitut)

Représentant de la Faculté d'Education
D. V. PARKER, Ph.D.

Représentant de la Faculté des Sciences
A. STEINER, DesSc. (Paris)

Représentant du Département des Langues romanes
N. BONVALET, Ph.D.

Représentant de l'A.C.F.A.
A. NOGUE, Secteur Education

Représentant de A.T.A.
(Alberta Teachers' Association)

Représentant de l'Ecole J. H. Picard

Représentants (5) de l'A.U.C.S.J.
(Association des Universitaires de C.S.J.)

Registraire de l'Université
L. TAYLOR

NOTE HISTORIQUE ET BUTS

Le Collège Saint-Jean a été fondé en 1908 l'année même où a été inaugurée la Faculté des Lettres et des Sciences de l'Université de l'Alberta.

Les deux institutions ont le même âge mais ont évolué de façon très différente. Le Collège est devenu Collège Universitaire Saint-Jean, partie intégrante et secteur bilingue de l'Université de l'Alberta, 62 ans après sa fondation, le 27 novembre 1970. Le statut officiel de Faculté lui fut octroyé en septembre 1977.

Comme faculté bilingue, elle doit d'abord permettre aux étudiants francophones de poursuivre leurs études universitaires dans un milieu qui leur assure une culture et un progrès intellectuel d'inspiration française, et ensuite permettre aux étudiants anglophones de bénéficier de ce milieu.

L'Université espère promouvoir ainsi la culture française en Alberta et permettre à un plus grand nombre d'étudiants de s'exprimer couramment dans les deux langues officielles au Canada.

G. CADRIN, Doct. (French)
S. T. CAREY, Ph.D. (Psychology)
J. COLSON, Doct. (Linguistics)
D. DESMARAIS, M.Sc. (Mathematics/Physics)
J. FORTIER, M.A. (Classics)
L. GODBOUT, L.Ph. (Philosophy)
H. HEBERT, M.P.E. (Physical Education)
M. KAPETANOVICH, D. U. (French)
R. A. PITTS, Ph.D. (Sociology)
S. SHERIDAN, Ph.D. (Biology)

Assistant Professors
G. ALLAIRE, M.A. (History)
E. A. AUNGER, Ph.D. (Political Sciences/Economics)
G. GUENETTE, M.A. (French)
A. LA FRANCE, B.A., B.Ed., M.Mus. (Music)
F. LEVASSEUR-OUIMET, B.Ed., M.A. (French)
L. MacCALLUM, M.A. (English)

Faculty Service Officer
S. LANDRY, (B.Ed.)

Librarian
G. E. DUROCHER, M.Lib.

ADDITIONAL MEMBERS OF THE FACULTY COUNCIL

President of the University
H. E. GUNNING, Ph.D., D.Sc., F.R.S.C.

Representative, Faculty of Arts
K. KROTKI, Ph.D. F.R.S.C.
(J.R. WILSON, Ph.D., alternate)

Representative, Faculty of Education
D. V. PARKER, Ph.D.

Representative, Faculty of Science
A. STEINER, Des. Sc. (Paris)

Representative, Department of Romance Languages
N. BONVALET, Ph.D.

Representative, A.C.F.A.
A. NOGUE, Education field

Representative, A.T.A.

Representative, J.H. Picard School

Representatives (5), A.U.C.S.J.
(Students' Union at Collège)

Registrar of the University
L. TAYLOR

HISTORICAL NOTE AND AIMS

Collège Saint-Jean was founded in 1908, the same year as the inauguration of the Faculty of Arts and Sciences of The University of Alberta.

Though of the same age, the two institutions have evolved in very differing fashion. The Collège became Collège Universitaire Saint-Jean, an integral part and a bilingual sector of The University of Alberta, 62 years later on November 27, 1970. Faculty status was granted in September 1977.

The goal of the Faculté firstly, as the bilingual faculty is, to allow students of French background to pursue their university studies in a French environment and, secondly, to allow students of English background to benefit by this environment.

The University thus hopes to foster French culture in Alberta and to allow more students to master the two official languages of Canada.

270.2 *Programmes d'études*

La Faculté Saint-Jean offre les programmes en vu d'un B.A., B.Ed., et B.Sc. billingue. Un étudiant qui désire s'incrire éventuellement dans une autre Faculté peut suivre à la Faculté Saint-Jean un Programme de Lettres et-ou de Sciences de première année. Ce droit s'applique par exemple aux étudiants qui désirent s'inscire éventuellement en: Commerce, Economie Domestique, Pharmacie, Education Physique, Sciences Médicales de laboratoire et autres. Pour tout autre renseignement à ce sujet, s'adresser au Doyen de la Faculté.

La Faculté permet aussi aux étudiants inscrits dans ces diverses facultés d'acquérir une meilleure connaissance de la langue et de la culture françaises.

Un étudiant inscrit à l'Université de l'Alberta dans une autre faculté peut suivre des cours enseignés à la Faculté Saint-Jean. Ces cours donnent des crédits équivalents à ceux obtenus dans des cours semblables suivis au Campus principal. Les candidats qui désirent suivre ces cours doivent obtenir l'autorisation du Doyen de la Faculté. Cette permission ne serait pas accordée à ceux qui désireraient ne suivre que Français 220.

NOTE: Pour de plus amples renseignements, voir l'Annuaire de la Faculté Saint-Jean.

270.2 *Programs of Study*

Faculté Saint-Jean offers a bilingual program towards the B.A., B.Ed., and B.Sc. degrees. A student who wishes to eventually register in a faculty other than Arts, Science, or Education may often take all his first year in a program of Arts and/or Science at Faculté Saint-Jean. This applies to students wishing to register eventually in: Commerce, Home Economics, Pharmacy, Physical Education, Medical Laboratory Sciences and others. For further information, contact the Dean of the Faculté.

The Faculté seeks to allow students registered in those faculties to develop their knowledge of the French language and culture.

A student registered at The University of Alberta in another faculty may take courses offered at Faculté Saint-Jean. Credits given for these courses are equivalent to those given for comparable courses on the main campus. Candidates wishing to take these courses must obtain the consent of the Dean of the Faculté. Permission would not be granted to students wishing to take only Français 220.

NOTE: For further information see the Faculté Saint-Jean Calendar.

271 FACULTY OF EXTENSION

The Faculty of Extension provides a wide variety of continuing education services to people in the northern part (and in some cases the whole) of Alberta. In the 1978-79 academic year, enrollment in the Faculty's 788 workshops, seminars, short courses and evening lectures totalled 26,560. In addition, the Faculty circulated to borrowers 171,000 books, 18,190 16 mm films, and 4,789 records.

The courses and seminars offered by the Faculty cover subjects ranging through business management, law, engineering, humanities, social sciences, natural and physical sciences, fine art, agriculture and adult education training. While large numbers of classes start in September, January and April, many other events are being offered at almost every time of the year. None of the courses in the Faculty carry degree credit, although some programs of study do lead to certificates. These non-credit courses appear to fill a real educational need felt by the people who want to continue their education, but do it in an informal way and are not subject to the performance pressures of degree study. Subjects for these courses are suggested by people in the community and also members of the University faculty. Courses can often be organized on very short notice in response to requests from individuals or groups who feel a particular educational need. All these programs are announced at various times throughout the year in descriptive brochures, catalogues, newspaper advertising, and on radio. A call to the Faculty at 432-3116 will put you on the mailing list for the latest information.

Members of the Extension faculty are also available to help all kinds of organizations and groups identify, analyse and solve their own continuing education problems. This is a growing and challenging part of the Faculty's work and you can find out more about it by getting in touch with the Dean at 432-2681.

The Extension Library's collection of 85,053 books is designed to serve rural residents of the Province with by-mail general library service. Membership in the Library is free and up to eight books can be borrowed at a time. The staff of the Library will provide reading guidance and also do some reference work for members. Blind and disabled people who are unable to read can borrow from a limited stock of "talking books". Enquiries about these services are invited from rural residents who do not have access to a local public library and they should write to The Librarian, Extension Library, The University of Alberta.

Everyone in the Province can benefit from the services of the Faculty of Extension's Educational Media Division. Its resources include 4,700 16 mm films (one of the largest libraries of such material in Canada), 4,849 records and 3,329 audio tapes. All this material is available at nominal rental and catalogues can be obtained by phoning 432-5041.

The Legal Resource Centre was established by the Faculty of Extension in 1975. The overall goal of the Centre is to facilitate the establishment of a comprehensive network of legal informational and educational services, thereby increasing public concern for and involvement in the legal process. The Centre seeks to achieve its goal by undertaking a range of service activities, and by encouraging or assisting others with similar goals. The Centre seeks to achieve its goal by undertaking a range of service activities, and by encouraging or assisting others with similar goals. The Centre addresses the needs of teachers, librarians, community leaders, interest groups, and children. The Centre estimates that in 1979 it received over 8,000 requests for

assistance and served over 5,000 people directly through its library, programming, and consulting services. One thousand eight hundred people were further served through the *Resource News*. It is impossible to say with certainty how many people have benefitted from the Legal Materials Placement Project, although it is estimated that one quarter of Albertans use their public libraries. Fifty libraries presently receive assistance under this project. Similarly, the audience for *Legal Maze*, the Centre's radio program, cannot be determined, but the Centre estimates that it may be as large as 20,000 listeners.

272.1 General Information

The courses listed below are planned for Special Sessions 1981-82. Please consult the appropriate "Schedule of Courses and Timetables" for information concerning scheduling of specific courses.

The language (French or English) used in describing the course indicates the language of instruction. For example, PHILE 354 (Philosophie 354) is described in French because it is taught in French, whereas ENGL 200 (English 200) is described in English, because it is taught in English.

Each course is designated by its computer abbreviation and a number. Students should use this abbreviation and number when filling in the registration forms. Following the title of the course is the symbol "★" standing for "course weight", and a number indicating the weight of the course as used in computing grade-point averages.

Courses numbered 100 to 199 are introductory, usually equivalent to high school courses. Those numbered 200 to 299 are junior courses, normally taken by first-year undergraduates. Those numbered 300 to 499 are senior courses, normally taken after the first year. Courses numbered 500 and up are normally restricted to senior and graduate students.

The course weight and the instructional time for a course appearing in this calendar is equal to that for the same course offered during the regular Winter Session.

Where "written consent" of a department or instructor is a prerequisite for taking a course, students must submit this with their registration forms.

The University reserves the right to impose registration quotas on, or to withdraw, any of the courses listed below.

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

272.2 Accounting

Faculty of Business Administration and Commerce

ACCTG 202. *Introductory Accounting.* ★3 Postulates, principles, the accounting cycle, capital and income measurement, financial statement preparation and analysis; emphasis on reporting to shareholders, creditors and other external decision makers. Prerequisite: ECON 201/202.

ACCTG 204. *Managerial Information and Control Systems.* ★3 Corporate goals, planning and control concepts, cost accumulation for pricing purposes, and product costing. Prerequisite: ACCTG 202.

ACCTG 302. *Intermediate Financial Accounting.* ★3 An in-depth treatment of the theory and methods of the GAAP (Generally Accepted Accounting Principles) model of Accounting, and an evaluation of its strengths and weaknesses. Comparative reference to alternative Accounting models will be made on a selective basis. Prerequisites: ACCTG 202, ACCTG 204, MANEC 323. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 304. *Accounting Information Systems.* ★3 Introduction to total information systems with emphasis on the role of accounting, using both conceptual reviews and case material pertaining to decision-making by owners, creditors, and managers. ACCTG 304 is recommended for students concentrating in Accounting. Prerequisite: ACCTG 204. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 404. *Intermediate Managerial Control Concepts.* ★3 Accounting for managerial decision-making. Emphasis on cost and revenue accumulation for control and pricing problems as well as on product costing. Prerequisites: ACCTG 204, MGTSC 356, ORG T 303, ORG T 305, or consent of the Faculty. Open only to Business Administration and Commerce students or by consent of the Department Chairman.

ACCTG 406. *Advanced Managerial Control Concepts.* ★3 Current research and cases in managerial accounting. Prerequisites: ACCTG 404. Open only to fourth year Business Administration and Commerce students or by consent of the Department Chairman.

NOTE: The following courses are open to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

ACCTG 452. *Introductory Financial Accounting.* ★3.

ACCTG 453. *Managerial Control Systems.* ★3.

272.3 Administration Scolaire/ Educational Administration

ADMSC 461. *Le Rôle du Professeur.* ★3.

272.4 Agricultural Economics

Department of Rural Economy

AG EC 433. *Advanced Farm and Ranch Management.* ★3 Application of concepts and tools of farm business management in farm planning and farm management extension. Manual and computerized methods of farm accounting, business analysis and planning; interpretation and use of information for decision making in organizing and operating a farm business to achieve goals; planning under risk and uncertainty; farm business arrangements and strategies for growth. Prerequisite: AG EC 333 or equivalent.

272.5 Animal Science

AN SC 380. *Livestock Growth and Meat Production.* ★3. Concepts of growth and development applied to meat production from domestic livestock. Form and function of carcass tissues in the live animal. Heredity and meat production. Prerequisite: One University Biology course.

AN SC 460. *Fundamentals of Nutrition.* ★3 The nutrients, their character, sources, digestion and metabolism. Reading assignments in relevant literature.

272.6 Anthropology

ANTHR 202. *Man and Culture.* ★6 An introduction to anthropological thought concerning such topics as race, evolution, culture growth and culture change. Not open to students with credit in ANTHR 306 or 307.

ANTHR 250. *Race and Racism in the Modern World.* ★3 The challenge of racism in modern societies and the response of anthropology, including the history of the "race" concept in explaining human variation and the uses of racialist notions in discussions of individual and social differences.

ANTHR 306. *Introduction to Prehistory.* ★3 The nature, purposes, theory and methods of pre-history and its relation to Anthropology as a whole. Note: Not open to students who have taken ANTHR 202.

See colored pages for times and sessions when courses are offered.

ANTHR 307. *Introduction to Social and Cultural Anthropology.* ★3 The comparative study of human society and culture, particularly non-Western communities, with special attention to the family, social structure, economics, and political institutions and religion; processes of change. Note: Not open to students who have taken ANTHR 202.

ANTHR 309. *Introduction to Physical Anthropology.* ★3 Survey of theory and basic data in human evolution and human variation. Topics include primatology, osteology, hominoid paleontology, variation in modern populations.

ANTHR 325. *Anthropology and World Problems.* ★6 An anthropological approach to the culture of capitalism, the social structure of colonial and neocolonial relations and the emergence of new societies.

ANTHR 330. *Technology in Culture.* ★3 An anthropological introduction to the evolution of tools and techniques; the adaptation of society to environment through technology; the interrelationship of technology, ideology, and social organization.

ANTHR 350. *Indians of North America.* ★6 A survey of North American Indian cultures and civilizations. Special attention given to social organization, economic systems, prehistoric and historic social change. Some emphasis on Indians of Canada in historic and present-day perspectives.

ANTHR 355. *Contemporary Canadian Native Peoples.* ★3 Anthropological perspectives on some current situations of native peoples in Canada.

ANTHR 392. *Primate Behavior.* ★3. Emphasis on field studies of non-human primates. Topics to include: social organization, behavior and ecology, territorial behavior communication, reproductive behavior and other relevant topics.

ANTHR 396. *Archaeological Field Training.* ★6. Instruction in all practical aspects of archaeological field techniques, including excavation, survey, recording, photography, and conservation. Held at a selected location in Alberta during both Spring and Summer sessions. Prerequisites: ANTHR 202 or 306 or equivalent, and consent of the Department.

ANTHR 410. *Sex and Status in Comparative Perspective.* ★3 Sexual status as a biological and as a cultural phenomenon. The social position of women in various societies. Prerequisite: A senior-level course in Anthropology or Sociology.

ANTHR 480. *Method and Theory in Prehistoric Archaeology.* ★6. A comprehensive survey of the methods and techniques used in prehistoric archaeology, including auxiliary sciences; conceptual approaches and models used for interpreting archaeological data and cultural history; the relation of explanatory theory in cultural history to anthropology as a whole. Prerequisite: ANTHR 306, or consent of the Department. Note: (A) This course will be given in Montana during the Summer Session only. It will be open to individuals with some background in either cultural anthropology or archaeology. Consent of the Department is required. The course, which is taught as a Field School in the Pryor Mountains of Montana (near Yellowstone), provides a balance between theory and method by placing an equal emphasis upon the collection, analysis, and interpretation of data. In addition to providing experience in reconnaissance and excavation techniques, the course will allow adequate time for labs and seminars. There will also be flintknapping demonstrations and sessions on how to relate this kind of data to the archaeological record. Weekends will be free for excursions to nearby points of interest. Those interested may obtain further information from the Department of Anthropology. (B) A letter of Permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will *not* be refunded except in cases of extreme distress. Participants must arrange their own transportation to and from Montana, and are requested to bring their own tents and camping gear. (C) Audit privileges are not extended to students in this course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by May 8, 1981. Registration will be limited to 15 students.

ANTHR 498. *Paleo-environmental Studies.* ★3 Lectures on the use of ecological, geological, and cultural data for the reconstruction and analysis of the role of humans in a prehistoric ecosystem. Prerequisite: GEOL 484 and ANTHR 494 or consent of the Department.

ANTHR 590. *Advanced Physical Anthropology: Methods in the Study of Primate Behavior.* ★6 This course, designed for upper-division undergraduates and graduate students, is offered as a practicum in methods and research design. Elements of research design, especially data gathering and analysis, are discussed and applied in classroom and field situations. The course, which is taught as a field school at Arashiyama West Institute, near Dilley, Texas, provides lectures, labs and field experience in the methods of observing the behavior of monkeys in a non-caged environment. Observational techniques (using various kinds of data sheets, audio and video-tape, and computer keyboard), sampling methods, data preparation and analysis, and the practical difficulties of working with live animals in a free-ranging situation will all be taught, experienced and discussed. There also will be presentations by other primatologists, experienced in various types of research situations (cage-studies, colony studies, small enclosure studies, field studies) and visits to two nearby primate research centers. The Arashiyama West Institute Research Ranch is ideal as a training ground in ethological field methods. Systematic observational and data collecting techniques can be easily demonstrated and applied with this well studied and well habituated group. The research facility consists of an electrically fenced 50 acre enclosure in which the Arashiyama West troop of Japanese macaques range freely. This "semi-free ranging" situation combines the best of controlled, captive animal studies and the much more difficult free ranging animal studies. Thus it is excellent for an initial field experience. This group of monkeys has been continuously studied in Texas, and formerly Japan, since 1953. All the animals are individually known and marked for easy identification. Genealogical, management and population data for the group are available. In addition to work at the Institute site in Dilley, instructional and training sessions will be held at the Southwest Regional Foundation for Research and Education in San Antonio, some 70 miles from Dilley. There observational studies of baboons in a 10 acre enclosure are being carried out under the supervision of Dr. A. M. Coelho, and students will have the opportunity of seeing techniques of data collection on computer-linked keyboards in action. Classes will commence on May 4, with several days of classroom instruction and discussion. The class will then move to the field to the primate research centres until the end of May. Students would then attend the meeting of the American Primatological Society from June 2-6 in nearby San Antonio, Texas. Instructors and students will arrange their own transportation to and from Dilley, Texas. Arrangements will be made to meet students at Dilley and drive them to the field site. A camphouse with cooking facilities, running water and flush toilet is provided on the ranch, however, students wishing to sleep in their own tents may do so. On-site transportation will be available and an air-conditioned trailer is provided for daytime classroom use. Students will be asked to share the costs and cooking of their food. A list of required field gear, and any further information should be obtained from the instructor, Linda Fedigan, Department of Anthropology, University of Alberta. Note: (A) This course will be given in Texas during the Spring Session only. Those interested may obtain further information from the Department of Anthropology. (B) A letter of Permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will *not* be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in this course. Students who do not wish

See colored pages for times and sessions when courses are offered.

credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by April 1, 1981. Registration will be limited to 15 students.

272.7 Arabic

Department of Classics

ARAB 100. *Introductory Literary Arabic.* ★6 Pronunciation and grammar of Arabic from the Qur'an.

ARAB 300. *Intermediate Literary Arabic.* ★6 Reading of classical and modern texts. Prerequisite: ARAB 100 or consent of the Department. Note: This course will not be offered until 1981-82.

272.8 Art

Department of Art and Design

NOTE: Students enrolling in "X" sections of 300 level plus studio courses should note that Departmental approval is a prerequisite and that there is also a priority system in giving approvals.

The Department of Art and Design normally retains examples of student's work executed for class projects in Studio Courses.

ART 231. *Visual Fundamentals.* ★6 A studio based introduction to the exploration and production, in two and three dimensions, of visually expressed information. Note: Not open to students with credit in ART 232.

ART H 303. *Art in the 17th Century.* ★3 The history of the art, architecture and applied arts of the early Baroque in Europe. Note: Formerly part of ART 402.

ART H 304. *Canadian Art I.* ★3. The history of painting, sculpture and architecture from the 17th Century to the end of the 19th Century in Canada. Note: Formerly part of ART 304.

ART H 305. *19th Century Art I.* ★3. The history of the art, architecture and applied arts of the first half of the 19th Century in Europe. Note: Formerly part of ART 400.

ART H 306. *20th Century Art I.* ★3. The history of the art, architecture and applied arts of the first half of the 20th Century. Note: Formerly part of ART 401.

ART 312. *Painting.* ★6 Introduction to the principles and techniques of painting. Prerequisite: ART 231 or 232 and consent of the Department.

ART 322. *Printmaking.* ★6 Introduction to the principles and technical applications of printmaking including a study of Intaglio, Relief, Silkscreens, and Lithography. Prerequisite: ART 231 or 232 and consent of the Department.

ART 339. *Special Projects in Studio Disciplines.* ★6 A course intended to meet the special needs of students not otherwise satisfied under existing regulations in regular course offerings. Prerequisite: Consent of the Department.

ART 339/439/539. *Special Projects in Studio Disciplines: Design Awareness—Study Trip to Europe.* ★6 This course is an overview of the qualities and applications of contemporary industrial, graphic, interior, furniture and architectural design and their influence on the culture and economy of England and West Germany. The course is scheduled for May 4, 1981-June 12, 1981. The first two weeks will be spent in lectures on campus—the following four weeks will be spent in England and West Germany. The course normally requires the submission of two term papers and/or visual reports: one at the conclusion of the two-week lecture period and one upon termination of the travel portion of the course. Note: (A) This course will be offered in England and West Germany during the Spring Session 1981 only. Those interested may obtain further information from Professor Nobuoki Ohtani, Department of Art and Design. (B) A letter of Permission will be needed by students applying from other universities to ensure that proper credit will be given. If not enrolled in a degree program apply for Special Student status. The tuition fee will *not* be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in the course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) These courses will be withdrawn unless there is a minimum of 15 students enrolled by the 1st of April, 1981. Total registration will be limited to 20 students.

ART H 353. *Art in the 18th Century.* ★3 The history of the art, architecture and applied arts of the later Baroque and Rococo in Europe. Note: Formerly part of ART 402.

ART H 354. *Canadian Art II.* ★3 The history of painting, sculpture and architecture of the 20th Century in Canada. Note: Formerly part of ART 304.

ART H 355. *19th Century Art II.* ★3. The history of the art, architecture and applied arts of the second half of the 19th Century in Europe. Note: Formerly part of ART 400.

ART H 356. *20th Century Art II.* ★3. The history of the art, architecture and applied arts of the second half of the 20th Century. Note: Formerly part of ART 401.

ART 362. *Sculpture.* ★6 Foundation studies in sculpture. Prerequisite: ART 231 or 232 and consent of the Department.

ART 372. *Industrial Design.* ★6 Foundation studies in three-dimensional design. Prerequisite: ART 231 or 232 and consent of the Department.

ART 392. *Visual Communication Design.* ★6 Introduction to the study and practice of design principles and techniques, mainly in two dimensional media. Prerequisites: Normally ART 231 or 232 and/or consent of the Department.

ART 422. *Printmaking.* ★6 Directed individual study of the principles and technical applications of printmaking. Choice of study from three of the following: Intaglio, Relief, Silkscreen and Lithography. Prerequisist: ART 322, and consent of the Department.

ART 439. *Special Projects in Studio Disciplines.* ★6 Special projects in studio disciplines by special arrangement with the Department. Prerequisite: Consent of the Department.

ART 462. *Sculpture.* ★6 Intermediate studies in sculpture. Prerequisite: ART 362, and consent of the Department.

ART 522. *Printmaking.* ★6 Advanced individual study of the principles and technical applications of printmaking in two of the following: Intaglio, Relief, Silkscreen and Lithography. Prerequisite: ART 422 and consent of the Department.

ART 539. *Special Projects in Studio Disciplines.* ★6 Special projects in studio disciplines, by special arrangement with the Department. Prerequisite: Consent of the Department.

ART 562. *Sculpture.* ★6 Advanced studies in sculpture. Prerequisite: ART 462 and consent of the Department.

272.9 Biology

Departments of Botany, Genetics, Microbiology and Zoology (Faculty of Science) in co-operation with the Departments of Entomology (Faculty of Agriculture and Forestry) and Bacteriology (Faculty of Medicine)

BIOL 296. *Evolutionary Biology.* ★3 The numbers and kinds of organisms, their origins, structures, systematic relationships, and modes and mechanisms of evolution. Prerequisite: BIOL 30.

BIOL 297. *Heredity.* ★3 The cellular and molecular basis of the transmission of hereditary characteristics. Mendelian inheritance and its cytological basis; microbial genetics; cytoplasmic inheritance, linkage and genetic mapping; DNA as genetic material; gene action; the genetic code. Prerequisite: BIOL 30.

BIOL 298. *Environmental Biology.* ★3 The basic principles and concepts of ecology. Emphasis on structure and function of populations, communities, and ecosystems. Laboratory to include ecological experiments, demonstrations, and discussions. Prerequisite: BIOL 30.

BIOL 299. *Biological Function.* ★3 Comparative physiology of animals and higher plants from the standpoint of nutrition, energetics, gas exchange, circulation, ionic and osmotic relations and control systems. Prerequisite: BIOL 30.

See colored pages or times and sessions when courses are offered.

272.10 Botany

BOT 304. *Field Botany.* ★3 (Summer Session Only) Designed to acquaint the students with the collecting, identifying and curating of the major groups of plants in their natural habitats. Topics will include selected ecological and phytosociological concepts, field methods, keys and identifications and herbarium methods. Effective handling of both specimens and field data for scientific purposes will be stressed. Plant collections prepared to acceptable herbarium standards will be required of those taking this course. Prerequisite: BIOL 30 or 130 or permission of the instructor. This course is not for credit in the Botany Honors or Specialization in Botany programs of study. There will be a transportation charge of $5.00 or less per person.

BOT 511. *Advanced Plant Ecology.* ★3 Seminar discussion of major and contemporary topics in plant ecology, using general readings and students' abstracts of published papers. Prerequisite: BOT 332 or equivalent, or consent of the Department. Offered in alternate years. (Not offered in 1980-81.)

272.11 Business

Faculty of Business Administration and Commerce

BUS 365. *Administration of the Small Business.* ★3 Issues related to the small business. Prerequisite: FIN 304.

BUS 401. *Theory of Policy Making.* ★3 Case studies in business policy. Prerequisites: MANEC 312, FIN 304, IND R 304, MGTSC 356 and MARK 304.

NOTE: The following courses are open to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

BUS 502. *Seminar in Management Information Systems.* ★3

BUS 555. *Business Policy I.* ★3.

BUS 556. *Business Policy II.* ★3.

272.12 Canadian Studies

CANST 300. *The Politics of the Arts in Canada.* ★6 A comparative study of the public and private cultural organization and its effect on the development of the arts in Canada. Prerequisite: Open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.

272.13 Canadien-Francais/ French-Canadian

Faculté St. Jean

CA FR 420. *Analyse grammaticale.* ★3. Cours intensif avancé d'analyse grammaticale. Théorie et traveaux pratiques. Prérequis: Accord du Doyen.

272.14 Reserved

272.15 Chemistry

CHEM 200. *Introductory University Chemistry.* ★6 Bonding and structure, chemical and phase equilbria; solution chemistry; thermochemistry; electrochemistry and chemical kinetics, with applications to inorganic chemistry. Prerequisite: CHEM 100, or Chemistry 30, or equivalent.

CHEM 250. *Organic Chemistry.* ★6 The study of functional groups found in the main classes of organic compounds and their molecular conformation and stereochemistry in such a way that the chemistry of some molecules important to biology (*e.g.*, amino acids, proteins, medicinals, pesticides, fats, sugars, carbohydrates, nucleic acids) as well as some molecules found in every day life (soaps, detergents, fibers, perfumes, polymers, etc.) can be discussed. Prerequisite: CHEM 30, or CHEM 100, or equivalent. Note: Students with credit in CHEM 200 or 202 will proceed to CHEM 350. Exceptions to this may be made only if written consent from the Department is obtained.

CHEM 555. *Theoretical Organic Chemistry.* ★3 Prerequisite: CHEM 450 or 550.

CHEM 559. *Natural Products.* ★3 Prerequisites: CHEM 450 or 550; and 551.

CHEM 561. *Advanced Organic Synthesis.* ★3 A study of reactions of organic compounds with emphasis on advanced synthetic methods. Prerequisite: CHEM 450 or 550 and consent of the Department.

272.16 Christian Theology

Saint Joseph's College

CHR T 344. *Catholicism: Late Middle Ages to Modern Times.* ★3 The history of the Church, its beliefs and theology, its struggles with reformers and nation states, from the days of schism to ecumenism.

CHR T 349. *Christianity and Social Justice.* ★3. Examines particular problems of social justice in the world and in Canada and the alternative solutions offered by contemporary thinkers from a Christian point of view. This course includes Christian social thought, Christian pacifism, theology of politics.

CHR T 351. *The Christian Meaning of Sex and Marriage.* ★3 The sexual revolution and its relevance for sexual ethics; pre-marital sex; marriage breakdown and divorce; sex as a human reality; Christian meaning of marriage.

CHR T 352. *Medical-Moral Problems.* ★3 Christian reasons for valuing life; examination from a Christian perspective of euthanasia, abortion, genetic research, sterilization, reproductive technologies, medical experimentation; rights of patients.

CHR T 364. *Dimensions of Christian Faith.* ★3 A study of Christian faith as a human and religious problem. Biblical views on faith will be examined as well as diverse interpretations of faith within the Christian tradition. Particular problems to be studied: the relationship between faith experiences and human experiences as such; the relationship between authority and freedom; individual faith and the faith of a community; faith and culture; the possibility of Christian faith today.

CHR T 370. *Contemporary Theology of the Catholic Church.* ★3 What does it mean to be a Catholic Christian in the modern world? What is expected of the Christian? What is the Christian? What is the Christian to become? A study of contemporary ecclesiological themes, in light of the needs of modern man and modern youth.

CHR T 372. *The Eucharist in Christian Worship.* ★3 A theological study of the development of Catholic liturgy from the Jewish foundation to the present day. A study of the Eucharist both as sacrifice and as sacrament. Contemporary theological developments in the liturgy both in theory and practice.

CHR T 379. *Theology and Liturgy of Eastern Christian Churches in Communion with Rome.* ★3 An introduction to the theology and liturgy of Eastern Christianity with special attention to the Ukrainian Church.

CHR T 380. *Catechetics I.* ★3. Problems which catechetics faces today, with emphasis on the analysis of basic religious experience in the meeting of God and man in Scripture, in Christ, liturgy and doctrine. Note: Formerly part of CHR T 378. Not open for credit to students with credit in CHR T 378.

CHR T 411. *Seminar in Ecumenism.* ★3 An examination of the Protestant-Catholic-Orthodox dialogues in the Twentieth Century and the efforts to recover the unity-within-diversity of Christianity. Prerequisites: Two previous courses in Christian Theology or permission of the College.

See colored pages for times and sessions when courses are offered.

272.17 Civil Engineering

CIV E 676. *Behavior and Design of Masonry Structures.* ★3

272.18 Classics

CLASS 202. *Greek and Roman Mythology.* ★3 A survey of classical mythology with readings in translation from various ancient authors as well as from modern scholarly works. Note: Formerly part of CLASS 240.

CLASS 230. *Introduction to the Ancient Near East and Greece.* ★3 An introductory course in the history of the Ancient Near East and Greece from the Neolithic Age to the Fourth Century A.D. Note: May not be taken concurrently with or subsequent to CLASS 363/364.

CLASS 231. *Introduction to Rome and the West.* ★3 An introductory course in the history of Rome and the Western Mediterranean to the collapse of the Roman Empire. Note: May not be taken concurrently with or subsequent to CLASS 365/366 and 371/372.

CLASS 369. *Early Civilizations I.* ★3 A survey of the beginnings and development of civilization in the Near East, including Sumer, Babylon, Assyria and the Hebrews.

CLASS 370. *Early Civilizations II.* ★3 The development of civilization in the western half of the Fertile Crescent, including the rise and decline of the Egyptian, Hittite and Phoenician cultures.

CLASS 475. *Practical Methods in Classical Archaeology.* ★3 The techniques of excavation and recording in Classical Archaeology. Prerequisite: Consent of the Department. Note: (A) This course will be offered in south Italy during the Summer Session only. (July 2-August 13.) It will be open to individuals with some background in Classics, Ancient History or Archaeology. This course is taught at a field school near Ruoti in the province of Potenza, at the University's excavation of the villa at San Giovanni. Students taking the course will be trained in (a) distinguishing and excavating archaeological strata; (b) recording the structures and materials found; (c) elementary on-site draftsmanship; (d) classifying and cataloguing artifacts, especially pottery, in the excavation laboratory; (e) techniques of recovering animal and plant remains; (f) archaeological survey of the surrounding countryside. This course will be taught by several members of the excavation staff, and some sessions will be given at a nearby Roman site near Atella. Weekends will be free for excursions to nearby points of interest. Those interested may obtain further information from the Department of Classics. (B) A letter of permission will be needed by students applying from other universities to ensure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition will *not* be refunded, except in cases of extreme distress. Free accommodation will be provided in the village school at Ruoti, but students will be responsible for bringing their own sleeping bags. There will be a charge of $10.00 per day for meals. Students must make their own way to Potenza where they will be met. Advice on travel, etc., may be obtained from the Department of Classics. (C) Audit privileges are not extended to students in this course. Students who do not wish credit may apply to the Dean for permission to register as Special Students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 10 students enrolled by May 8, 1981. Registration will be limited to 20 students.

272.19 Clothing and Textiles

Faculty of Home Economics

CL TX 417. *Selected Topics.* ★3 Topics of current interest in clothing, textiles and design. Prerequisite: varies with specific offering.

CL TX 417. *Selected Topics—Fashion Study Tour.* ★3 A field study of the Canadian fashion industry in its two major centres, Montreal and Toronto, based on visitation and analysis of the various components of the industry, their interrelationships and impact on the Canadian economy. Note: (A) This course will be given during the Spring Session 1981 only. Those interested may obtain a brochure giving further information from the Faculty of Home Economics or may consult Professor Elizabeth Crown. (B) A Letter of Permission will be needed by students applying from other universities to insure that credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will *not* be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in this course. Students who do not wish credit can apply to the Dean for permission to register as special students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 20 students enrolled by March 1, 1981.

CL TX 510. *Current Issues in Clothing and Textiles I: Kitchen Planning.* ★1 A study of the standards and details of kitchen planning; with emphasis on a creative problem-solving approach to kitchen design. Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single term course of full weight.

CL TX 511. *Current Issues in Clothing and Textiles II. Clothing for Special Needs.* ★1 A study of the clothing needs of the handicapped and elderly and ways of coping with these. Note: The combination of all three of CL TX 510, 511, 512 constitutes the equivalent of a single-term course of full weight.

CL TX 512. *Current Issues in Clothing and Textiles III: Textile Serviceability.* ★1 Recent developments in textile science are studies within the framework based on the concepts of serviceability. Note: The combination of all three of CL TX 510, 511, 512 constitute the equivalent of a single term course of full weight.

272.20 Computing Science

Note on credit for introductory Computing Science courses: Credit will be granted for only one of 214, 261, 300, 351 and 357, and only one of 215 and 352.

CMPUT 314. *Foundations of Computing Science.* ★3 Review of sets and relations; digraphs; applications of Boolean algebra; minimization; topological sorting, maximal flow and scheduling network algorithms; paths and cycle algorithms; finite representations of numbers and discrete structures; systematic programming; correctness of programs; algorithms, automata and formal grammars. Prerequisite: CMPUT 215 or 352. Credit will be granted for only one of CMPUT 314 or 364.

CMPUT 351. *Elements of Programming I.* ★3 Basic programming techniques using a high level language; representation and manipulation of numeric and non-numeric data; survey of computing systems, history and applications. See above note on introductory Computing Science courses.

CMPUT 352. *Elements of Programming II.* ★3 Problem solving; organization of data files; representation and manipulation of data structures; interfacing with operating systems; structure of computers; input-output and storage devices; introduction to assembler language programming and other programming languages. Prerequisite: CMPUT 214, 262, 300 or 351. See above note on introductory Computing Science courses.

272.21 Curriculum et Methodologie/Education —Curriculum and Instruction

Faculté St. Jean

CU ME 212. *La méthodologie de l'enseignement des etudes sociales (social studies) au niveau élémentaire.* ★3.

CU ME 216. *Mathématiques a l'elementaire.* ★3.

CU ME 220. *Sciences a l'elementaire.* ★3.

See colored pages for times and sessions when courses are offered.

CU ME 339. Enseignement de la musique au niveau élémentaire. ★3

CU ME 358. *L'enseignement du francais 1ère langue au niveau secondaire.* ★3

CU ME 359. *L'enseignement de la littérature au niveau secondaire.* ★3

CU ME 410. *L'enseignement de la littérature aux petits.* ★3

272.22 Dance

Department of Physical Education

DANCE 275. *Dance Forms.* ★3 Introduction to jazz dance.

DANCE 375. *Social Dance.* ★3 Theory and practice of social (ballroom) dance forms. Prerequisite: Consent of Department. (For B.P.E.; B.Ed., Phys. Ed. major and Rec. Admin. students only.)

272.23 Reserved

272.24 Drama

DRAMA 245. *Introduction to and Development of Oral Communication.* ★6 Exercises in voice and speech improvement and exploration of various techniques of oral communication. Note: Not open to students with credit in DRAMA 243, DRAMA 341, and former DRAMA 343.

DRAMA 251. *Improvisation.* ★3 Speech and movement improvisation with an emphasis on imaginative development; introduction to dramatic form.

DRAMA 321. *The Creative Process of Drama.* ★3 Practical and theoretical approach to the development of human resources through the creative process of drama. Prerequisite: DRAMA 251 or consent of the Department.

DRAMA 400. *Modern Theatre.* ★6 Major plays and theatre artists of the modern theatre. Exploration of the styles and movements which form the mosaic of the contemporary theatre.

DRAMA 507. *Senior Projects.* ★3 Prerequisite: Consent of the Department.

DRAMA 552. *Collective Theatre.* ★6 The collective preparation and public presentation of improvisational theatre. Prerequisite: DRAMA 459 and/or consent of the Department. Note: Not to be taken by students with credit in DRAMA 452

272.25 Economics

ECON 201. *Introduction to Micro-Economics.* ★3 Economic analysis, problems and policies with emphasis on the Canadian economy; the roles of consumers and firms in competitive and monopolistic markets; foreign ownership in the Canadian economy, the distribution of income, inequality and poverty; the use of the environment; government economic policies. Prerequisite: MATH 20 or MATH 33 or consent of the Department.

ECON 202. *Introduction to Macro-Economics.* ★3 Economic analysis, problems and policies with emphasis on the Canadian economy: national income and monetary theory; problems of unemployment and inflation; government monetary and fiscal policies: international trade theory, problems and government policies. Prerequisite: MATH 20 or MATH 33 or consent of the Department.

ECON 316. *The Canadian Economy, Part I.* ★3 A survey of Canadian economic development with emphasis on the function of staple exports, capital formation, government policies, and regional differentials which characterized the Nineteenth Century in Canada.

ECON 317. *The Canadian Economy, Part II.* ★3 A survey of the economic development of Canada in the Twentieth Century. This survey includes study of immigration, foreign investment, economic effects of two world wars, natural resource exploitation and the emergence of distinct economic regions in Canada. Prerequisite: ECON 316 or consent of the Department.

ECON 323. *International Economics.* ★3 A survey of the principles of international economics and the applications to economic policy. The topics are foreign trade, foreign investment, and the balance of payments. Prerequisite: ECON 201/2 or consent of the Department.

ECON 331. *Labor Economics.* ★3 Theory and empirical evidence concerning the supply of and demand for labor services, wage differentials and the impact of unions. Some of the policy issues to be discussed are income maintenance, unemployment insurance and minimum wage legislation. Prerequisites: ECON 201/2 or consent of the Department.

ECON 341. *Money and Finance.* ★3 Analysis of money and credit in the exchange process; the savings-investment process; commercial banking; financial intermediaries; financial markets; central banking. Prerequisite: ECON 201/2 or consent of the Department.

ECON 353. *Taxation Policy and Structure.* ★3 Analysis of the Canadian tax structure and its role in attaining certain goals of society; requirements for an optimal tax structure. Prerequisites: ECON 201/202 or consent of the Department.

ECON 355. *Economic Analysis in the Evaluation of Large-Scale Projects.* ★3 An examination of the use of cost-benefit analysis, location theory and input-output analysis in assessing the economic merits of various large-scale investment projects. Examples of current interest will be used, e.g. river basin, electrical generation and oil and gas projects. Prerequisite: ECON 201/2 or 304 or consent of the Department.

ECON 363. *Introduction to Regional Economics.* ★3 An appraisal of the historical and current pattern of regional income disparities in Canada, with analysis emphasizing the causes of regional variations in employment and economic growth levels. An assessment of present federal and provincial policies designed to alleviate regional disparities will be made, combined with new policy programs that may be relevant. Prerequisites: ECON 201/202 or consent of the Department.

ECON 365. *Resource Economics.* ★3 Problems of allocation and development of natural resources, including contemporary Canadian resource policy issues; nature and types of resources; the economics of conservation and resource scarcity; and the role of resources in growth. Prerequisites: ECON 201/202 or 304 or 306/307.

ECON 366. *Energy Economics.* ★3 Types of energy resources, substitutability, conversion. The relevance of energy to economic growth. Energy as input and as a consumers' good. An overview of quantities available and used. The problems of measuring energy, the energy balance, the energy industries. The role of energy in the Canadian economic development. World energy markets. Energy policy problems. Prerequisites: ECON 201/202 or 304 or 306/307.

ECON 373. *Industrial Organization.* ★3 A survey of the behavior and performance of firms in different market structures, and discussion of public policy toward the different structures. Prerequisite: ECON 201/2 or consent of the Department. Not open to students with credit in MANEC 312.

ECON 381. *Micro-Economic Analysis I.* ★3 The theory of consumer behavior; theory of production and cost: price and output determination under competition, monopoly and other market structures. Prerequisite: ECON 201/2 or consent of the Department. Not open to students with credit in MANEC 323.

ECON 382. *Macro-Economic Analysis I.* ★3 National income concepts and income determination; theories of aggregate consumption, investment and employment behavior; monetary and fiscal policy. Prerequisite: ECON 201/2 or consent of the Department. Not open to students with credit in MANEC 333.

ECON 672. *Topics in Industrial Economics.* ★3

ECON 693. *Topics in Comparative Economics.* ★3

See colored pages for times and sessions when courses are offered.

272.26 Education—Administration

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED ADM 401. *The Role of the Teacher.* ★3 Note: Formerly ED ADM 261/461.

ED ADM 463. *The Role of the Administrator and the Supervisor.* ★3 Open to senior undergraduate or graduate students in Education.

ED ADM 465. *Organization and Administration of Instruction in the School.* ★3 Open to senior undergraduate or graduate students in Education.

ED ADM 501. *Evolving Concepts in Educational Administration.* ★3 Note: Formerly ED ADM 561.

ED ADM 502. *Administrative Processes in Education.* ★3

ED ADM 505. *Selected Topics in Educational Administration I.* ★3

ED ADM 506. *Selected Topics in Educational Administration II.* ★3

ED ADM 511. *Research Design and Data Analysis I.* ★3

ED ADM 512. *Research Design and Data Analysis II.* ★3

ED ADM 515. *Research Projects I.* ★3 Prerequisite: Consent of the Department. (Formerly ED ADM 506).

ED ADM 516.*Research Projects II.* ★3 Prerequisite: Consent of the Department. (Formerly ED ADM 507).

ED ADM 521. *Supervision of Educational Personnel.* ★3 Note: Formerly ED ADM 525.

ED ADM 522. *Selected Topics in Educational Supervision.* ★3

ED ADM 527. *Orientations to Administrator-Student Relationships.* ★3

ED ADM 528. *Administration of Student Personnel Services.* ★3

ED ADM 532. *Organization of School Districts.* ★3

ED ADM 542. *Adaptive Processes in Educational Organizations.* ★3 Note: Formerly ED ADM 563.

ED ADM 546. *Educational Planning Processes.* ★3

ED ADM 547. *Models for Decision Making.* ★3 Note: Formerly ED ADM 569.

ED ADM 548. *Management of Information Systems.* ★3

ED ADM 551. *Administration of Public Education in Canada.* ★3 Note: Formerly ED ADM 559.

ED ADM 565. *Educational Finance.* ★3

ED ADM 566. *Operational Finance.* ★3

ED ADM 571. *Organization of Post-Secondary Education.* ★3

ED ADM 593. *Seminar and Practicum in Administrative Behavior I.* ★3 Prerequisite: Consent of the Department.

ED ADM 594. *Seminar and Practicum in Administrative Behavior II.* ★3 Prerequisite: Consent of the Department.

ED ADM 645. *Policy Development in Education I.* ★3 Note: Formerly ED ADM 667.

ED ADM 646. *Policy Development in Education II.* ★3 Note: Formerly ED ADM 668.

272.27 Education—Adult

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED ADU 439. *Methods and Programs in the Teaching of English as a Second Language to Adults.* ★3 Coordinated by the Department of Elementary Education.

ED ADU 460. *Conference Course in ED CI at Post-Secondary Level I.* ★3 Coordinated by the Department of Industrial and Vocational Education.

ED ADU 461. *Conference Course in ED CI at Post-Secondary Level: II.* ★3 Prerequisite: ED ADU 460. Coordinated by the Department of Industrial and Vocational Education.

ED ADU 521. *Psychology of Learning and Teaching at the Adult Level.* ★3 A study of learning and teaching from the background of educational and developmental psychology.

ED ADU 523. *Administration of Further Education.* ★3 Adult Education in sociological, cultural and economic perspectives; organization and implementation of programs. Coordinated by the Department of Educational Administration.

272.28 Education—Audio-Visual

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED AV 361. *Audiovisual Communications.* ★3

ED AV 363. *Preparation of Instructional Materials.* ★3

ED AV 465. *Principles of Graphic Communication.* ★3 Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 467. *Principles of Photographic Communication.* ★3 Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 471. *Educational Technology and Communication.* ★3 Prerequisite: ED AV 361; prerequisite or corequisite: ED AV 363 or consent of the Department.

ED AV 473. *Designing Multi-Media Instruction.* ★3 Prerequisite: ED AV 471.

ED AV 481. *Television in Education: Production and Use.* ★3 Prerequisite: ED AV 363; prerequisite or corequisite: ED AV 361 or consent of the Department.

ED AV 483. *Educational Television: Preparation of Instructional Materials for Television Use.* ★3 Prerequisite: ED AV 481 or consent of the Department.

ED AV 559. *Intermediate Production in Instructional Media.* ★3 Prerequisite: ED AV 467 or consent of the Department.

ED AV 561. *Organization and Supervision of the Audiovisual Media Program I.* ★3 Prerequisites: ED AV 361 and 363.

ED AV 563. *Organization and Supervision of the Audiovisual Program II.* ★3 Prerequisite: ED AV 561.

272.29 Education—Curriculum and Instruction, Elementary Education

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED CI 212. *Curriculum and Instruction in Elementary School Social Studies.* ★3

ED CI 216. *Curriculum and Instruction in Elementary School Mathematics.* ★3

ED CI 229. *Curriculum and Instruction in Elementary School Language.* ★3

MOV 231. *Curriculum and Instruction in Games K-VI.* ★3

ED CI 236. *Curriculum and Instruction in Elementary School Art.* ★3 Additional Laboratory time may be required.

ED CI 308. *Introduction to Second Language Teaching in the Elementary School.* ★3 Prerequisite: At least one course in the language to be taught or consent of the Department.

ED CI 309. *Introduction to the Teaching of English as a Second Language.* ★3

ED CI 312. *The Teaching of Current Canadian Social Issues in Elementary Schools.* ★3

ED CI 317. *Diagnostic: Teaching of Mathematics.* ★3 Prerequisite: ED CI 216 or equivalent.

ED CI 323. *Introduction to Elementary School Reading Instruction.* ★3 Senior students only. Credit granted for either ED CI 224 or ED CI 323 but not both.

ED CI 326. *Diagnostic Teaching of Reading.* ★3 Prerequisite: An ED CI course equivalent in reading.

See colored pages for times and sessions when courses are offered.

ED CI 329. *Elementary School Language.* ★3 Prerequisite: ED CI 229 or equivalent.

ED CI 332. *Speech Problems: Role of the Classroom Teacher.* ★3

ED CI 345. *Seminar in Group Projects in Elementary Education I.*★3 Prerequisite: Consent of the Department.

ED CI 346. *Introduction to School Libraries.* ★3

ED CI 348. *Reading in Junior High School.* ★3

ED CI 349. *Reading in Senior High School.* ★3

MOV 389. *Curriculum and Instruction in Outdoor Education, K-VI.* ★3 Prerequisite: MOV 201 or 202 or consent of the Department. Not open to first and second year students.

ED CI 404. *Curriculum and Instruction in Early Childhood Education.* ★6 Restricted to senior students in Early Childhood Education Specialization.

ED CI 408. *Methods and Programs in the Teaching of Second Languages in the Elementary School.* ★3 Prerequisite: ED CI 308 or consent of the Department.

ED CI 409. *Methods and Programs in the Teaching of English as a Second Language.* ★3 Prerequisite: ED CI 309 or consent of the Department.

ED CI 412. *Curriculum in Elementary School Social Studies.* ★3 Prerequisite: ED CI 212 or equivalent.

ED CI 413. *Instruction in Elementary School Social Studies.* ★3 Prerequisite or corequisite: ED CI 412. In addition, at least one course in social science or history or consent of the Department.

ED CI 420. *Curriculum in Elementary School Science.* ★3 Prerequisites: ED CI 320 and at least one laboratory science course or consent of the Department.

ED CI 423. *The Reading Process: Theory and Observation.* ★3 Prerequisite: ED CI 224 or 323 or written consent of the Department.

ED CI 424. *Reading in Early Childhood Education.* ★3 Prerequisite: ED CI 224 or 323.

ED CI 425. *Reading in Upper Elementary School.* ★3 Prerequisite: ED CI 224 or 323.

ED CI 430. *Creative Aspects of Language in the Elementary School.* ★3 Prerequisite: ED CI 229 or ED CI 329 or equivalent.

ED CI 443. *School Library Services.* ★3 Prerequisite: ED CI 346 or consent of the Department.

ED CI 444. *Supervised Independent Study in Elementary Education II.* ★3 Prerequisite: Consent of the Department.

ED CI 445. *Seminar in Group Projects in Elementary Education II.* ★3 Prerequisite: Consent of the Department.

ED CI 445. Lec 10 *Seminar in Group Projects in Elementary Education II: Teaching Speech in the Elementary School.* ★3 A course intended to help teachers to develop children's oral communication skills. The focus will be on activities designed to increase awareness of voice and speech and to expand vocal variety; to consider ways to interpret prose and poetry; and to promote effective speaker-audience interaction.

ED CI 445. Lec 30 *Seminar in Group Projects in Elementary Education II: Teaching Art in the Elementary School.* ★3 This course is directed to the teaching of art in the elementary school kindergarten to grade 6 with some attention to art programming for pre-schoolers. The course will be of interest to practicing classroom teachers who have a desire to develop the art programs they teach. Teachers will have opportunity to describe and evaluate their current art programs and to study, plan, implement and evaluate experiences in art for students in their own classes both in creating art and appreciating art. Four major aspects of the art program will be considered during the term: developing sensory perception, encouraging creative art expression, studying the artistic heritage and developing aesthetic judgment. This course will be school and classroom focused and will provide practicing teachers and others opportunity to consider alternatives in offering a well-rounded program in art and the relationships of art to the total school program. The wide variety of community resources for art teaching will be of particular interest.

ED CI 445. Lec 50 *Seminar in Group Projects in Elementary Education II: Integrating the Arts in the Elementary School.* ★3 A course designed for experienced teachers seeking knowledge relative to the basic role of the arts in elementary school curriculum. Experience will be provided within specific disciplines (art, drama, language arts and movement) so that a basic set of abilities and techniques used in each can be brought to a general integration for instructional purposes. A practical instructional assignment planned during the two-week course is to be completed before November 7, 1981. Prerequisite: at least one year teaching experience.

ED CI 446. *Selection of School Library Materials.* ★3 Prerequisite or corequisite: ED CI 346 or consent of the Department.

ED CI 447. *Organization of School Library Materials.* ★3 Prerequisite or corequisite: ED CI 346 or consent of the Department.

ED CI 501. *Seminar in Elementary Education.* ★3 Prerequisite: Consent of the Department.

ED CI 501. Lec 50 *Seminar in Elementary Education: Current Developments in Elementary School Mathematics.* ★3 Course especially designed for practising elementary school teachers. Six topics will be offered by the mathematics education staff, as follows: Problem Solving, Diagnosis, Calculators, Microcomputers, Enrichment, and Geometry. Registrants will choose any *three* of these topics for study. Prerequisite: B.Ed. degree and at least one year of teaching experience or consent of the Department.

ED CI 501. Lec 51 *Seminar in Elementary Education: Supervising Student Teachers in the 3-Phase Elementary Practicum.* ★3 This course is intended for cooperating teachers who are interested in examining more closely their roles and responsibilities in the supervision of student teachers, in examining effective ways of working with student teachers, and in examining the processes, developmental changes, and human relationships that the practicum involves.

ED CI 501. Lec 52 *Seminar in Elementary Education: Curriculum in Elementary Science: Recent Developments.* ★3

ED CI 504. *Program Development in Early Childhood.* ★3 Prerequisite: ED CI 404 or consent of the Department.

ED CI 505. *Research in Program Development in Early Childhood Education.* ★3 Prerequisite: ED CI 504 or consent of the Department.

ED CI 508. *Program Development in Second Languages at the Elementary Level.* ★6 Prerequisite: ED CI 408, or 409 or consent of the Department.

ED CI 509. *Problems in the Teaching of English as a Second or Other Language.* ★3 Prerequisite: ED CI 309 and 409 or equivalent.

ED CI 510. *Program Development in the Teaching of English as a Second or Other Language.* ★3

ED CI 512. *Program Development in Elementary Social Studies I.* ★3 Prerequisites: ED CI 412 and ED CI 413 or consent of the Department.

ED CI 513. *Program Development in Elementary Social Studies II.* ★3 Prerequisite: ED CI 512 or consent of the Department.

ED CI 516. *Program Development in Elementary School Mathematics I.* ★3 Prerequisite: ED CI 417 or consent of the Department.

ED CI 517. *Research in Mathematics Education I.* ★3 Prerequisite: ED CI 417 or consent of the Department.

ED CI 520. *Program Development in Elementary School Science.* ★6 Prerequisite: ED CI 420 or consent of the Department.

ED CI 522. *Research in Reading Processes I.* ★3 Prerequisite: Consent of the Department.

ED CI 525. *Diagnosis of Reading Disability.* ★3 Prerequisite: Consent of the Department.

ED CI 526. *Remedial Procedures for Reading Problems.* ★3 Prerequisite: Consent of the Department.

ED CI 528. *Organization of the Reading Program* ★3 Problems of organization, development, evaluation and supervision of the reading program. Prerequisite: Consent of the Department.

See colored pages for times and sessions when courses are offered.

ED CI 529. *Language Acquisition and Growth in Young School Children.* ★3 Prerequisite: ED CI 429 or 430 or equivalent.

ED CI 530. *Program Development for the Expansion of Elementary Children's Language.* ★3 Prerequisite: ED CI 529.

ED CI 537. *Program Development in the Art Curriculum: Performance, Art History and Criticism Aspects.* ★6 Prerequisite: ED CI 437 or ED CI 392 or 492 or consent of the Department.

ED CI 539. *Program Development in Elementary School Music.* ★6 Prerequisite: ED CI 439 or consent of the Department.

ED CI 544. *Directed Individual Study in Elementary Education.* ★3 Prerequisite: Consent of the Department.

272.30 Education—Curriculum and Instruction, Elementary and Secondary (Common Courses)

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED CI 448. *The Mathematics Curriculum in the Elementary and Secondary School.* ★3

ED CI 549. *Curriculum Development.* ★3 Curriculum theory and research with particular reference to determinants of curriculum, curriculum development, implementation and evaluation.

ED CI 550. *Current Curriculum Developments.* ★3 Problems and practices in innovation and evaluation of current curriculum developments.

ED CI 649. *Curriculum Evaluation.* ★3 An interdepartmental seminar devoted to an examination of *evaluation* in the broad perspective of its place in education.

ED CI 650. *Curriculum Evaluation Practicum.* ★3 The preparation and implementation of an evaluation study in the field. Prerequisite or corequisite: ED CI 649.

272.31 Education—Curriculum and Instruction, Secondary Education

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED CI 356. *Curriculum and Instruction in Secondary School Second Language I.* ★3 Prerequisites or corequisites: Three full courses in the teaching specialization.

ED CI 366. *Modern Curriculum Problems in Secondary School Mathematics.* ★3 Prerequisite: ED CI 364 or consent of the Department.

ED CI 391. *Practicum in Secondary School Music I.* ★6

ED CI 393. *Advanced Curriculum and Instruction in Secondary Drama Education I.* ★3 Prerequisites or corequisites: ED CI 389/390 or 489/490.

ED CI 452. *Teaching Literature in the Secondary School.* ★3

ED CI 453. *Teaching Language and Composition in the Secondary School.* ★3

ED CI 458. *New Approaches to Second Language Instruction.* ★3

ED CI 459. *Advanced Curriculum and Instruction in Second Language Teaching.* ★3

ED CI 462. *Innovations in Secondary School Social Studies Curriculum.* ★3 Note: Prerequisite: ED CI 360/361 or 460/461 or consent of the Department.

ED CI 463. *New Approaches in Secondary School Social Studies Instruction.* ★3 Prerequisites: ED CI 360/361 or 460/461 or consent of the Department.

ED CI 467. *Teaching Mathematics in the Junior High School.* ★3

ED CI 480. *Advanced Curriculum and Instruction in Secondary Business Education I.* ★3 Prerequisite: ED CI 378 or 478 or consent of the Department.

ED CI 481. *Advanced Curriculum and Instruction in Secondary School Business Education II.* ★3 Prerequisite: ED CI 480.

ED CI 484. *Advanced Curriculum and Instruction in Secondary School Home Economics II.* ★3 Prerequisites: ED CI 382/383 or consent of the Department.

ED CI 486. *Fine Arts Criticism in the Secondary School.* ★3 Prerequisite: Consent of the Department.

ED CI 491. *Practicum in Secondary School Music II.* ★6 Registration limited to secondary route students on a music specialization who have completed the first year of MELAB.

ED CI 493. *Advanced Curriculum and Instruction in Secondary Drama Education II.* ★3 Prerequisite: ED CI 393.

ED CI 497. *Conference Seminar.* ★3

ED CI 497. *Conference Seminar.* ★3 Developing Communication Strategies and Modules (French) (Jonguiere, Quebec)

ED CI 498. *Conference Seminar.* ★3

ED CI 498. *Conference Seminar.* ★3 Developing AV Material for Modules to Include Cultural Elements (Jonguiere, Quebec)

ED CI 565. *Secondary Mathematics Education Program Development.* ★3

ED CI 596. *Research Methods in Secondary Education.* ★3

ED CI 598. *Conference Seminar in Secondary Education I.* ★3 Prerequisite: Consent of instructor and Department.

ED CI 656. *Seminar: Secondary Education Second Language.* ★6

ED CI 698. *Conference Seminar in Secondary Education II.* ★3 Prerequisite: Consent of instructor and Department.

272.32 Education—Foundations

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED FDN 341. *Concepts of Childhood in History.* ★3 A study of those views of childhood which have exerted a significant influence on educational theory and practice over the last two hundred years. Formerly ED FDN 481.

ED FDN 401. *Selected Topics in Educational Foundations.* ★3 Prerequisite: Consent of the Department.

ED FDN 420. *Contemporary Systems of Education in Western Europe, the U.S.A. and the U.S.S.R.* ★3 Formerly ED FDN 471.

ED FDN 422. *Education in Developing Countries: A Study of Education in Selected Areas in Asia, Africa and Latin America.* ★3 Formerly ED FDN 473.

ED FDN 430. *History of Education in Western Canada.* ★3 Formerly ED FDN 351.

ED FDN 431. *The Education of Selected Minority Groups in Western Canada: A Historical Study.* ★3 An examination of the education of immigrants and their children since Confederation with special attention to the content and agencies of Canadianization. Formerly ED FDN 353.

ED FDN 432. *The Education of Native People in Canada: A Historical Study.* ★3 An examination of the education of Indian, Metis and Eskimo peoples with special attention to church-state and federal-provincial relations. Formerly ED FDN 355.

ED FDN 441. *History of Educational Thought in Modern Times.* ★3 A study of writers who have influenced educational theories and practices in the Western World since Rousseau. Formerly ED FDN 497.

ED FDN 452. *Education and Theories of Knowledge: A Philosophical Approach.* ★3 Formerly ED FDN 447.

ED FDN 453. *Logic in Teaching.* ★3 A study of logical techniques employed by classroom teachers including definition, explanation and justification. Emphasis will be on the application of these techniques. Formerly ED FDN 449.

See colored pages for times and sessions when courses are offered.

ED FDN 454. *Social Philosophy and Education.* ★3 An examination of some basic concepts of social philosophy and their relation to education. Formerly ED FDN 493.

ED FDN 462. *The Sociology of the School.* ★3 Prerequisite: SOC 202 or SOC 403 or ED FDN 460 or equivalent. Formerly ED FDN 417.

ED FDN 463. *Youth, Social Change and Socializing Agencies.* ★3 Prerequisite: SOC 202 or SOC 403 or ED FDN 460 or equivalent. Formerly ED FDN 419.

ED FDN 470. *Issues in Contemporary Education.* ★3 A critical examination of selected educational issues. Formerly ED FDN 451.

ED FDN 474. *Contemporary Issues in the Education of Native Peoples: A Social Science Perspective.* ★3 An analysis of current issues of debate in Indian, Metis and Eskimo education, with special reference to their social origins. Formerly ED FDN 455.

ED FDN 501. *Conference Course on Selected Topics.* ★3 Prerequisite: Consent of the Department.

ED FDN 512. *Anthropological Theory and Education.* ★6 Formerly ED FDN 526.

ED FDN 521. *Studies of Educational Change in Western Nations.* ★3 Formerly ED FDN 571.

ED FDN 522. *Functions of Education in the Development of Emerging Nations.* ★3 Formerly ED FDN 573.

ED FDN 530. *History of Education in Canada.* ★3 A survey of studies in the history of formal and informal educational institutions in Canada, and their interrelationship with Canadian society. Formerly ED FDN 504.

ED FDN 540. *History of Modern Education.* ★3 Formerly ED FDN 503.

ED FDN 545. *Studies in the History of Schooling and Curriculum.* ★3

ED FDN 546. *Childhood and Childrearing in Western Culture: An Historical Perspective.* ★3

ED FDN 551. *Philosophy of Education I.* ★3 Formerly ED FDN 591.

ED FDN 552. *Philosophy of Education II.* ★3 Formerly ED FDN 593.

ED FDN 555. *Moral Concepts of Education.* ★3 Formerly ED FDN 537.

ED FDN 557. *Learning and the Philosophy of Knowledge.* ★3

ED FDN 560. *Education from a Sociological Perspective.* ★3 Formerly ED FDN 507.

ED FDN 561. *Community Education: A Sociological Perspective.* ★3 The organization and processes of community education at the local, provincial and national levels of social interaction as seen from the theory and research of contemporary sociology. Formerly ED FDN 511.

ED FDN 563. *Research Methods in Sociology of Education.* ★3 Formerly ED FDN 515.

ED FDN 564. *Education and Social Change.* ★3 Formerly ED FDN 517.

272.33 Education—Industrial Arts

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED IND 223. *Practicum I.* Work experience following the first year of University study, directed at the specific business or industry in which the student receives supervised field experience. No course credit (open only to Plan I students).

ED IND 235. *Technology II. Graphics Technologies.* ★3 Study of the processes, procedures and materials inherent in the graphics technologies.

ED IND 245. *Introduction to Vocational Technical Education.* ★3 Background and role of vocational education in Canada and abroad, including the early influences of apprenticeship and guilds.

ED IND 323. *Practicum II.* Work experience following the second year of university study, directed at the specific business or industry in which the student receives supervised field experience. No course credit (open only to Plan I students).

ED IND 343. *Practicum III.* Work experience following the completion of the third year of University study, directed at the specific business or industry in which the student receives supervised field experience. No course credit (open only to Plan I students).

ED IND 385. *Methods of Performance Evaluation in Vocational Education.* ★3

ED IND 423. *Practicum IV.* Work experience following the completion of the fourth year of University study directed at the specific business or industry in which the student receives supervised field experience. No course credit (open only to Plan I students).

ED IND 436. *Technology II-A.* ★3 Further study of Graphics Technologies. Prerequisite: ED IND 235.

ED IND 465. *Manpower and Curriculum Implications.* ★3 Further study of vocational technical education including implications for manpower training.

ED IND 490. *Writing of Learning/Training Objectives.* ★3 Writing detailed learning and/or training objectives for competency based programs.

ED IND 496. *Individual Directed Study.* ★3 Prerequisite: Consent of the Department.

ED IND 498. *Individual Directed Laboratory Study.* ★3 Prerequisite: Consent of the Department.

ED IND 509. *Development and Principles of Industrial and Vocational Education.* ★3

ED IND 511. *Curriculum and Instruction in Industrial and Vocational Education.* ★3

ED IND 519. *Supervision and Planning of Industrial and Vocational Facilities and Programs.* ★3

ED IND 521. *Evaluation of Industrial and Vocational Education Programs.* ★3

ED IND 587. *Individual Directed Study.* ★3 Prerequisite: Consent of the Department.

ED IND 589. *Organization of Industrial and Vocational Education.* ★3

ED IND 591. *Problems and Trends in Industrial and Vocational Education.* ★3

272.34 Education—Practicum

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED PR 200. *Student Teaching Elementary.* ★6 (100 hrs.). Note: Available only with permission of the Dean.

ED PR 201. *Student Teaching: Elementary.* ★3 (50 hrs.).

ED PR 251. *A Study of Classroom Behavior.* ★3 An education option in the practicum (student teaching) component.

ED PR 301. *Student Teaching: Elementary.* ★3 (50 hrs.).

ED PR 351. *Student Teaching.* ★3 (50 hrs.).

ED PR 353. *Student Teaching.* ★3 (50 hrs.).

ED PR 355. *Student Teaching in the Secondary School.* ★3 (50 hours).

ED PR 356. *Student Teaching in the Secondary School.* ★3 (50 hrs.).

ED PR 402. *Student Teaching Elementary .*★9 (225 hrs.).

ED PR 454. *Student Teaching at Post-Secondary Level: I.* ★3

ED PR 455. *Student Teaching at Post-Secondary Level: II.* ★3

272.35 Education—Psychology

The appearance of a course in the following list does not constitute any guarantee that the course will be offered.

ED PSY 329. *Educational Psychology of Adolescence.* ★3

See colored pages for times and sessions when courses are offered.

ED PSY 341. *Psychology of Exceptional Children and Youth.* ★3 No prerequisites. Not to be taken by students with credit in ED PSY 251/253.

ED PSY 343. *Education of Exceptional Children and Youth.* ★3 Prerequisite: ED PSY 341. Not to be taken by students with credit in ED PSY 251/253.

ED PSY 351. *Developmental and Learning Characteristics of Exceptional Children.* ★3 Prerequisites: ED PSY 251 and 253; or consent of the Department. Special Education students only.

ED PSY 355. *Psychoeducational Diagnosis and Assessment of Exceptional Children.* ★3 Prerequisites: ED PSY 251 and 253; or consent of the Department. Special Education students only.

ED PSY 357. *Behavioral and Instructional Management of Exceptional Children.* ★3 Prerequisites: ED PSY 351 and 355, or consent of the Department. Special Education students only.

ED PSY 361. *Seminar and Clinical Practicum: Exceptional Children.* ★3 Prerequisites: ED PSY 351 and 355. Special Education students only.

ED PSY 411. *Introduction to Guidance.* ★3 Prerequisite: ED PSY 269 and 271 or equivalents.

ED PSY 412. *The Psychology of Classroom Communication.* ★6

ED PSY 419. *Educational and Vocational Guidance in the Classroom.* ★3 Prerequisites: ED PSY 269 and 271 or equivalent.

ED PSY 425. *Psychology of Confluent Education.* ★3 Prerequisite or corequisite: ED PSY 469 and consent of the Department. Note: Formerly ED PSY 465.

ED PSY 453. *Interdisciplinary Perspectives on Exceptionality.* ★3 Prerequisites: ED PSY 361 or consent of the Department. Special Education students only.

ED PSY 459. *Seminar in Special Education.* ★3 Prerequisite: ED PSY 361 or consent of the Department. Special Education students only.

ED PSY 461. *Seminar and Classroom Practicum: Exceptional Children.* ★3 Prerequisite: ED PSY 361, Prerequisite or corequisite: ED PSY 357. Special Education students only.

ED PSY 469. *Human Development and Education.* ★3 Prerequisite: ED PSY 269 or equivalent.

ED PSY 471. *Learning and Instruction.* ★3 Prerequisite: ED PSY 271 or equivalent.

ED PSY 473. *Language and Cognition in the Education of the Child.* ★3 Prerequisites: ED PSY 269 and 271 or equivalent.

ED PSY 475. *Individual Differences in Education.* ★3 Prerequisites: ED PSY 269 and 271 or equivalent.

ED PSY 487. *Principles of Classroom Measurement.* ★3 Prerequisite: ED PSY 269 and 271 or consent of the Department.

ED PSY 489. *Test Construction for Teachers.* ★3 Prerequisite: ED PSY 269 and 271 or consent of the Department.

ED PSY 497. *Senior Seminars.* ★3 Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period.

ED PSY 502. *Introduction to Educational Research.* ★6

ED PSY 510. *Counselling Theory I.* ★6 Prerequisite or corequisite: ED PSY 515 or consent of the Department.

ED PSY 511. *Vocational Development and Choice.* ★3

ED PSY 512. *Seminar and Practicum in Counselling I.* ★6 Prerequisite or corequisite: ED PSY 515 and 510 or equivalent and consent of the Department.

ED PSY 513. *Group Assessment in Guidance and Counselling.* ★3 Prerequisite: ED PSY 487 or equivalent; or consent of the Department.

ED PSY 515. *Theories of Personality.* ★3

ED PSY 517. *Religious and Moral Development and Education.* ★3

ED PSY 521. *Interpersonal Relations in Education.* ★3 Prerequisite: Consent of the Department.

ED PSY 531. *Psychology of Exceptional Children.* ★3 An overview of the psychology of exceptional children with emphasis on intellectual and emotional deviance, learning disability, mental retardation, sensory deficits and the problems of deprivation.

ED PSY 533. *Advanced Course in Psychoeducational Diagnosis.* ★3 To provide skill in administration and interpretation of a variety of psychoeducational measures which show potential in advancing our understanding of exceptional children.

ED PSY 535. *Educational Programming from Psychoeducational Data.* ★3 Prerequisite: ED PSY 524, 533 or consent of the Department.

ED PSY 537. *Task Analysis and Instructional Design in Special Education.* ★3 To provide skill in developing curriculum materials and instructional sequencing and criterion referenced tests through task analysis.

ED PSY 538. *Practicum in Special Education.* ★6 Supervised practicum in a variety of special education settings. Prerequisite: ED PSY 531.

ED PSY 539. *Behavior Management in Schools.* ★3 To provide skill in implementing behavior management practices in classroom settings as well as skills for assisting teachers to implement behavior management techniques.

ED PSY 569. *Advanced Educational Psychology: Development.* ★3

ED PSY 571. *Advanced Educational Psychology: Learning.* ★3

ED PSY 578. *Psychology of Language, Cognition and Bilingualism.* ★6 Prerequisite: Consent of the Department.

ED PSY 580. *Seminar and Research in Educational Measurement.* ★6 Prerequisite: ED PSY 502, its equivalent or consent of the Department.

ED PSY 591. *Social Psychology and Education.* ★3

ED PSY 597. *Special Seminars.* ★3 Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title descriptive of content. May be repeated.

ED PSY 598. *Special Seminars.* ★6 Prerequisite: Consent of the Department. Content varies from year to year. Topics announced prior to registration period. The student's transcript carries title desctiptive of content. May be repeated.

ED PSY 676. *Psychology of Learning.* ★6

272.36 Engineering, General

ENGG 210. *Engineering Graphics.* ▫3.5 Sketching, drafting and interpretation of pictorials and multiviews of three-dimensional objects; visual design; introduction to scales, sectioning; dimensioning. (★3)

ENGG 231. *Engineering Statics II.* ▫3.0 Centroids and centers of gravity. Forces in beams and cables. Force and moment diagrams. Distributed forces. Fluid Statics. Second moments of area. Prerequisites: ENGG 230, MATH 212. (★3)

272.37 English

ENGL 200. *A Survey of English Literature from the Middle Ages to the Twentieth Century.* ★6 A close study of representative masterpieces which demonstrate the development of the English literary tradition.

ENGL 210. *English Literary Forms.* ★6 This course combines an introduction to the various genres of English literature (prose, poetry and drama) with formal instruction in writing skills. One-third of the course is devoted to writing instruction.

ENGL 215. *Introduction to the Study of Literature.* ★3 A close reading of significant works of prose and poetry in English, to introduce the student to the most effective ways of understanding the various genres of English literature. Three essays will be required. Note: This course is prerequisite to ENGL 270, 275, 284 and 290. Formerly part of ENGL 260 and 265.

See colored pages for times and sessions when courses are offered.

ENGL 270. *Readings in Poetry.* ★3 A close study of selected modern and traditional verse to introduce the student to ways of approaching and critically evaluating poetry.

ENGL 275. *Readings in Prose.* ★3 A close study of novels, short stories, essays, and other forms, both modern and traditional, to introduce the student to ways of approaching prose, and to assist him in reading critically.

ENGL 284. *Canadian Literature in Process.* ★3 An intensive reading of mainly contemporary Canadian novels, stories, poems, and plays, in English.

ENGL 288. *An Introduction to the English Language.* ★6 A historical and structural study of the sounds, grammar, and vocabulary of English.

NOTE: Senior courses have as prerequisite ENGL 200 or 210 or any two single-term 200-level courses in English.

ENGL 305. *The Development of Children's Literature.* ★3 A study of the history of children's literature, with works of representative writers. Note: Not to be taken by students having credit in ENGL 398.

ENGL 306. *Folklore in Children's Literature.* ★3 A study of myths, folk-tales, legends and other oral materials drawn into English literature from a variety of cultural traditions. Note: Not to be taken by students having credit in English 398.

ENGL 309. *Expository Writing.* ★6 The purpose of this course is to increase the student's ability to write clear expository prose. The study of models of prose style will be central, combined with frequent practice in writing on the basis of such models.

ENGL 313. *The Modern English Language.* ★3 A study of modern grammar, semantics, and stylistics. Note: Formerly part of ENGL 388.

ENGL 331. *The Later English Renaissance.* ★3 The literature of Seventeenth-Century England, including Milton, in the light of intellectual developments of the period. Note: Formerly part of ENGL 344.

ENGL 333. *Shakespeare.* ★3 Selected works of Shakespeare. Note: Not to be taken by students with credit in ENGL 332.

ENGL 335. *English Drama to 1642.* ★3 Representative works by medieval and later dramatists including Shakespeare, showing the development of English drama. Note: Formerly part of ENGL 390.

ENGL 343. *The Age of Johnson.* ★3 Works of representative writers of the later Eighteenth Century, including the precursors of Romanticism. Formerly part of ENGL 348.

ENGL 345. *The British Romantic Period.* ★3 Representative works of the Romantic poets and related prose materials. Note: Not to be taken by students with credit in ENGL 356.

ENGL 350. *The Earlier Victorian Age.* ★6 Representative works of the earlier Victorians. Note: Not to be taken by students with credit in ENGL 364 or 372. Formerly a single-term course.

ENGL 351. *The Later Victorian Age.* ★3 Representative works of the later Victorians. Note: Not to be taken by students with credit in ENGL 364 or 372.

ENGL 355. *Drama from the Restoration to 1870.* ★3 Representative works of Restoration and later dramatists, showing changes in the English drama. Note: Formerly part of ENGL 390.

ENGL 356. *Poetry and Prose of the Romantic Period.* ★6 Readings in the Major Romantic Poets. Note: Not to be taken by students with credit in ENGL 345.

ENGL 360. *The Modern American Novel.* ★3 Representative works of Twentieth Century American novelists. Note: Not to be taken by students with credit in ENGL 383.

ENGL 361. *The Modern British Novel.* ★3 Representative works of Twentieth Century British novelists. Note: Not to be taken by students having credit in ENGL 380.

ENGL 363. *Modern Drama.* ★3 Selected plays of British and American dramatists. Note: Not to be taken by students with credit in ENGL 391 or 362.

ENGL 364. *Modern Canadian Drama.* ★3 Selected plays by dramatists of English-speaking Canada.

ENGL 366. *The Short Story.* ★3 Representative works of writers illustrating the tradition of the short story in English.

ENGL 369. *The Canadian Literary Tradition: Urban.* ★3 Representative works of writers of English-speaking Canada. Note: Not to be taken by students having credit in ENGL 384.

ENGL 370. *Regional Literature of Canada.* ★3 Representative works of writers of English-speaking Canada.

ENGL 374. *Commonwealth Literature.* ★3 Representative works of writers from various areas of the Commonwealth. Note: Formerly part of ENGL 399.

ENGL 377. *Introduction to Creative Writing: Poetry.* ★3 Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 379. *Intermediate Creative Writing: Poetry.* ★3 Requires consent of the instructor. Note: Formerly part of ENGL 396.

ENGL 384. *Canadian Literature.* ★6 An historical and critical study of the literature of English-speaking Canada. Note: Not to be taken by students with credit in ENGL 367 or 369.

ENGL 385. *The King James Bible in English Literature.* ★6 A literary study of selections from the Old and New Testaments of the King James Bible, and of the influence of the King James Bible in English literature.

ENGL 398. *Children's Literature.* ★6 A historical and critical study of children's literature in English. It includes books written especially for children and books annexed from English literature by children. The course is divided into two parts: a study of myth and folklore drawn into English literature from various cultural traditions, and a study of works in English. Note: Not to be taken by students having credit in ENGL 305 or 306.

ENGL 407. *Creative Writing: Advanced Fiction.* ★6 Prerequisites: Two 300-level courses, one of which is to be a creative writing course, and consent of the instructor.

ENGL 408. *Creative Writing: Advanced Poetry.* ★6 Prerequisites: Two 300-level courses, one of which is to be a creative writing course, and consent of the instructor.

ENGL 676. *The Twentieth Century Novel.* ★6

ENGL 695. *Studies in Literary Themes.* ★3

272.38 Enseignement Pratique

ENPRQ 203. *Enseignement pratique: Niveau élémentaire.* ★3

ENPRQ 204. *Enseignement pratique: Niveau élémentaire.* ★3

ENPRQ 205. *Enseignement pratique: Niveau élémentaire.* ★3

ENPRQ 254. *Enseignement pratique: Niveau secondaire.* ★3

ENPRQ 255. *Enseignement pratique: Niveau secondaire.* ★3

ENPRQ 256. *Enseignement pratique: Niveau secondaire.* ★3

272.39 Family Studies

Faculty of Home Economics

FAM 346. *Courtship and Marriage.* ★3 A consideration of the sociological, psychological and personal factors entering into the selection of a mate, the development of a relationship, and problems of marital adjustment. Lecture with emphasis on group discussion.

FAM 359. *Presentation and Communication.* ★3 Introduction to the principles of communication; their application in interpersonal, group and mass audience situations relevant to home economics. Practice in verbal communication, demonstrations and display. Prerequisites: A half course in sociology, psychology or family studies (FAM 350 for non-family majors or FAM 241 for family majors) and at least two half courses in the student's major.

FAM 440. *Consumer Problems.* ★3 An analysis of problems faced by the family as consumer, within the framework of the economic, sociological, psychological and legal factors

See colored pages for times and sessions when courses are offered.

which create these problems. Sources of information and aid for the consumer. Prerequisite: ECON 201/202 or 306/307 or completion of an approved economics module available from the Division.

FAM 445. *Practicum in Family Services.* ★6 Students will be placed in one of a variety of family related agencies for two full days per week. In addition, attendance at one seminar per week is required. Prerequisite: FAM 444. Note: Open only to senior family studies majors. Must be taken during the same year as FAM 444.

FAM 448. *Understanding Family Communication.* ★3 The synthesis of knowledge of communication with knowledge of family relationships and the application of that combination to the student's experience. Emphasis is placed on the effect of communication on individual behaviour and family patterns.

FAM 449. *Family Study: Selected Topics.* ★3 Students may enroll in this course more than once provided that each time it is taken the topic is different. Note: To be offered alternate years to FAM 442.

FAM 460. *Family and Consumer Law.* ★3 An exploration of family and consumer law from a user's perspective. (To be taught in cooperation with the Faculty of Law.) This course will be offered during Special Sessions only.

FAM 541. *Seminar: Human Sexuality and Sex Education in Family Life Education.* ★3 Emphasis on socio-psycho-cultural factors in development of human sexuality, with consideration given to research findings and their practical application, i.e., sex education. By permission of instructor only.

272.40 Finance

FIN 304. *Business Finance.* ★3 Introduction to financial decision-making. Prerequisite: ACCTG 204, MANEC 323, MGTSC 307, 357.

FIN 411. *Investment Principles: Security Analysis.* ★3 Theories of investment with special reference to types of securities, prices and market operation. Analytical techniques in the selection of securities. Prerequisite: FIN 304.

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

FIN 456. *Finance.* ★3

FIN 562. *Portfolio Management.* ★3

FIN 563. *Corporate Financial Planning.* ★3

272.41 Fondements de l'Education/Educational Foundations

Faculté St. Jean

FO ED 452. *Approche philosophique de l'education et des théories du savoir.* ★3 (Ancien FO ED 447.)

272.42 Foods and Nutrition

Faculty of Home Economics

FD NU 325. *Introductory Nutrition I.* ★3 A study of carbohydrates, fats and proteins, and the role which minerals and vitamins play in their metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent.

FD NU 326. *Introductory Nutrition I.* ★3 A non-laboratory course in nutrition. Lectures are the same as FD NU 325. Selected reading from the literature will be required. Prerequisite: CHEM 250 or PHYSL 260, 261, or 262 or equivalent. Credit may not be obtained for both FD NU 325 and FD NU 326.

FD NU 327. *Introductory Nutrition II.* ★3 Emphasis will be on minerals and vitamins; their chemical and physiological roles in metabolism; food sources and requirements of man at various phases of the life cycle. Selected nutritional problems will be considered during the laboratory. Prerequisite: FD NU 325.

272.43 Food Science

FD SC 200. *Introduction to Food Science.* ★3 Historical and philosophical aspects of food supplies and food processing. World food supply and utilization. Trends in the processing, preservation, handling and utilization of food. Food fads and fallacies. No prerequisite.

272.44 Forest Science

FOR 463. *Wildland Recreation Planning.* ★3 Survey of current principles and practices relevant to the planning of parks, wilderness areas and recreational environments in wildland settings. Emphasis on current case studies. Prerequisite: FOR 360 or FOR 462 or equivalent.

272.45 French Language and Literature

Department of Romance Languages

FREN 100. *Beginners' French.* ★6 Designed to enable students entering with complete matriculation but without French to begin their study of this language in the University. Note: Normally, students will go from French 100 to French 200.

FREN 200. *First Year University French.* ★6 Intensive training in spoken and written French, including grammar, composition and literature. Prerequisite: FREN 30 or equivalent. Note: Not open for credit to students having credit or registered in Faculte St. Jean FRANC 220 or 222 or CA FR 220 or 222.

FREN 201. *First Year University French for Teachers.* ★6 Designed to teach future teachers of French to speak and to write the language. Three hours of grammar and two hours of audio-visual learning per week. Prerequisite: FREN 30 or equivalent. Note: Arts students must obtain permission of the Dean before registering in this course. Not open for credit to students having credit or registered in Faculte St. Jean FRANC 220 or 222 or CA FR 220 or 222.

FREN 301. *Second Year University French.* ★6 Designed to perfect written and oral knowledge of French. The course aims at achieving adequate fluency to enable students to proceed in literature, translation and/or composition courses. Prerequisite: Any 200 level French course except FREN 205 or 206.

FREN 370. *Introduction to French Literature of the Nineteenth Century.* ★3 Prerequisite or corequisite: FREN 330. Note: Not open for credit to students having credit or registered in Faculte St. Jean FRANC 327.

FREN 380. *Introduction to French Literature of the Twentieth Century.* ★3 Prerequisite or corequisite: FREN 330. Note: Not open for credit to students having credit or registered in Faculte St. Jean FRANC 328.

FREN 390. *Introduction to Children's Literature in French.* ★3 A survey of children's literature in French especially designed for future teachers of French. Prerequisite: any 300-level French or French-Canadian course except the 300-level reading courses. Note: Normally restricted to Faculty of Education students. Arts students require permission of the Department to take this course. (Jonquiere, Quebec)

FREN 408. *Third Year French for Honors Language Students.* ★3 Intensive advanced grammar, written and oral expression. Prerequisite: FREN 308 or consent of the Department. Note: Not open for credit to students having credit or registered in Faculte St. Jean CA FR 420. (Jonquiere, Quebec)

See colored pages for times and sessions when courses are offered.

272.46 French-Canadian Language and Literature

Department of Romance Languages

FR CA 333. *Aspects of French-Canadian Civilization and Culture II.* ★3 Contemporary French-Canadian civilization and culture as seen through representative authors. Practical work in composition. Prerequisite: Any 200-level course except FREN 205 or 206. Note: Formerly part of FR CA 331. Not open for credit to students having credit or registered in Faculte St. Jean CA FR 322.

FR CA 499. *Directed Reading.* ★3 or ★6 Designed to meet the needs of individual students. Prerequisite: Any 300-level French or French-Canadian course except the 300-level reading courses.

272.47 Reserved

272.48 Geography

NOTE: STUDENTS ARE RESPONSIBLE FOR THEIR OWN ACCOMMODATION AND MEAL EXPENSES FOR THE FOLLOWING GEOGRAPHY COURSES WHICH INVOLVE OVERNIGHT FIELD TRIPS: 309, 438, 439, 465, 509, 530, 531, 532, 535 AND 536. STUDENTS WILL BE CHARGED AN ADDITIONAL $2.00 TO COVER THE COST OF TRANSPORTATION ON FIELD TRIPS ASSOCIATED WITH GEOG 230/231.

GEOG 230. *Introductory Physical Geography I.* ★3 Introduction to geomorphology: the nature and formation of major landform features of the earth's surface. Rock weathering and slope movements. Landforms developed by erosional and depositional processes of rivers, glaciers, winds, waves and currents. A field trip in the Edmonton area may be offered. Laboratory work required.

GEOG 231. *Introductory Physical Geography II.* ★3 Introduction to the atmosphere and biosphere. Physical elements of weather and climate. Causes, changes and patterns of weather. Climatic classification. Spatial and dynamic interrelations of climate, soils and vegetation. Laboratory work required. Note: GEOG 230 does not have to precede GEOG 231.

GEOG 250. *Spatial Organization of Human Activity.* ★3 The search for order in man's occupation of the earth and of his distribution across it; maps as techniques for understanding reality.

GEOG 251. *Introduction to Cultural Geography.* ★3 The significance of human distribution on the earth. Man's relation to the physical environment; world population problems; cultural patterns in the world.

GEOG 360. *Geography of Rural Canada.* ★3 The physical environment and the development of rural Canada; physical limits and economic margins; agricultural and rural development; the future for rural Canada.

GEOG 364. *The Influence of Man on the Natural Environment.* ★3 Introduction to basic concepts necessary for a general understanding of processes whereby man initiates environmental change, intentionally and unintentionally.

GEOG 366. *Water Resources in Developing Countries.* ★3 The role of water in developing countries, especially in Asia, South America and Africa. Present and projected water requirements, demand and use, rural and urban supplies, quality, health, sanitation and decision-making.

GEOG 381. *Geography of the City.* ★3 Origin and spread of urban settlement, problems arising from the growth and form of metropolitan areas and intercity systems.

GEOG 438. *Mountain Geomorphology.* ★3 Analysis of the major landforms and geomorphic processes in mountain areas. Topics will include glaciers, avalanches, action of running water, periglacial and masswasting processes. Field trips may be required. Prerequisite: GEOG 230 or equivalent.

GEOG 439. *Environmental Hazards.* ★3 Analysis of natural hazards presented to man by the physical environment. Topics will include floods, earth dynamics, mass movements, avalanches, drought, and violent storms. Prerequisite: GEOG 230, or equivalent.

GEOG 447. *Man in the Arid Lands.* ★3 An analysis of environmental factors and problems of human adjustment associated with the world's dry lands in the low and mid-latitudes.

GEOG 462. *Spatial Analysis.* ★3 Evaluation of the characteristics of location patterns. Location factors. Basic criteria employed to analyze spatial patterns. Analysis of patterns of spatial equilibrium, linkages, networks, movement and hierarchies. Prerequisite: Consent of the instructor.

GEOG 458. *Transportation Geography.* ★3 Basic concepts and principles of transportation geography with particular emphasis on the evolution and distribution of transport facilities; the role of transportation services in economic geography; and their significance in both interregional and intraregional interactions. Special emphasis on Canada.

GEOG 465. *Boreal Ecology I.* ★3 Physical environment of the boreal region: climatic processes (emphasizing winter conditions); regional physiography (especially glaciation, periglacial geomorphology, permafrost and soils); environmental modification by man. Laboratory will consist of field studies. Prerequisite: Consent of the instructor. Note: Boreal Ecology II appears as ZOOL 466.

GEOG 466. *Boreal Ecology I.* ★3 The lecture portion of GEOG 465.

GEOG 481. *Urban Geography.* ★3 The geographer's approach to the study of urban phenomena; social and physical configurations; process and change within the urban areas; urban goals and attitudes. Prerequisite: GEOG 381 or SOC 353.

GEOG 510. *Historical Geography.* ★3 The development of historical geography and its relationship to geography and history; case studies in the geography of selected areas at given times in the past utilizing regional and topical approaches. Prerequisite: A previous course in geography or consent of the instructor.

GEOG 529. *Application of Quantitative Methods and Computer Programming in Geography.* ★3 Prerequisites: GEOG 429 or consent of the instructor.

GEOG 531. *Advanced Glacial Geomorphology.* ★3 Prerequisite: GEOG 309 or GEOL 482 or consent of the instructor.

GEOG 532. *Periglacial Geomorphology.* ★3 The study of cold-climate landforms. Climatic and geomorphic controls. Weathering and slope formation. Landforms developed in permafrost regions, emphasizing patterned ground formation. Periglacial landforms as micro-habitats. Prerequisite: GEOG 309 or GEOL 482 or consent of the instructor.

GEOG 536. *Karst Geomorphology.* ★3

272.49 Geology

NOTE: STUDENTS ARE RESPONSIBLE FOR THEIR OWN ACCOMMODATION AND MEAL EXPENSES ON ALL GEOLOGY FIELD TRIPS.

GEOL 300. *Introductory Studies in Geology.* ★3 Minerals, rocks, fossils and the interpretation of geological maps. Geology 300, 301 and 302 together are considered equivalent to Geology 202 and 203 for prerequisite purposes. Not available to students with credit in Geology 202 and 203. Prerequisites: GEOL 301 and 302.

GEOL 301. *Earth Science I.* ★3 Nature, origin and evolution of the universe and of planetary systems; the physical properties of the earth and of its environment; the materials and structures of the earth's interior and surface and the processes affecting these regions, such as continental drift, the formation of ocean basins and mountain building. Not available to students who have taken Geology 202, or 390.

GEOL 302. *Earth Science II.* ★3 The hydrologic cycle and the cycle of erosion; measurement of geologic time;

See colored pages for times and sessions when courses are offered.

history of life on earth and the geological evolution of North America; glaciation and the ice-age; groundwater and water-supply; nature and origin of mineral deposits; geology of coal, oil and gas; the conservation of natural resources. Not available to students with credit in Geology 203, 205 or 306. Prerequisite: GEOL 301.

GEOL 305. *Environment Earth.* ★3 Early history of the earth; formation of the hydrosphere and atmosphere and their evolution to the present 'stable' state; atmosphere and hydrosphere as solar-powered heat engines; hydrologic cycle, water supply and groundwater; geological factors affecting the disposal of waste; quantitative evaluation of the effects on the environment of man's exploitation and use of mineral resources; future availability of fuel and of metallic minerals; permafrost, exploration and construction; earthquakes and man-made explosions; earth resources; observational satellites. Prerequisites: GEOL 202 and 203 or GEOL 301 and 302.

GEOL 306. *The Succession of Life Through Geological Time.* ★3 Nature of the primitive earth and the origin of self-replacing molecules; earth environment and its influence on the development of life; modification of the early environment by developing life forms; nature of the fossil record; sequence of development and interrelationships of the major animal and plant groups. Not available to students with credit in GEOL 203 or 302.

GEOL 307. *Earth Science III.* ★3 Modern theories of the evolution of the earth, particularly as applied to Western Canada. Impact of current thought on classical geological, scientific and philosophical problems. Prerequisite: GEOL 202 or 301.

GEOL 588. *Hydrogeology.* ★3 Occurrence, distribution, movement and chemistry of groundwater as a function of the geological environment; groundwater as a geologic agent; methods of collection, organization and use of hydrogeologic data; groundwater budgets, model studies, selected problems and case histories. Prerequisites: GEOL 380, MATH 204.

GEOL 631. *Mineralogy Seminar.* ★3

272.50 German

Department of Germanic Languages

GERM 100. *Conversational German for Beginners.* ★6 Designed to lead to mastery of spoken and written German, with strong emphasis on the development of oral communication skills. Note: Not open to students with credit in GERM 30, GERM 101, or GERM 102.

272.51 Hebrew

Department of Classics

HEB 100. *Introductory Classical Hebrew.* ★6 Basic grammar of Hebrew and selected readings from the documents of the Pentateuch.

272.52 History

HIST 200. *European History.* ★6 The evolution of European society from the decline of the Roman Empire in the West to the present.

HIST 201. *European History since the Renaissance.* ★6

HIST 278. *An Introduction to the Study of Canadian History 1500-1867.* ★3 Designed to provide a foundation for senior and advanced courses in Canadian History.

HIST 279. *An Introduction to the Study of Canadian History 1867-1967.* ★3 Designed to provide a foundation for senior and advanced courses in Canadian History.

HIST 280. *Asia to 1500.* ★3 A survey of the history of Asia to the beginning of the sixteenth century.

HIST 309. *Revolutionary and Nineteenth Century Europe.* ★6

HIST 334. *Ancient and Medieval Urkaine.* ★3 The social, political and cultural development of Ukrainian lands from prehistory through the Fifteenth Century. The impact of the Normans, Byzantium, and the Steppe Nomads.

HIST 335. *Ukraine in Early Modern Times.* ★3 Ukraine in the Polish-Lithuanian commonwealth. The rise of the Cossacks and their confrontations with the Turko-Tartars, Poland, and Muskovy. Religious controversies and cultural trends in the age of Baroque. Note: Formerly part of HIST 327.

HIST 336. *Nineteenth Century Ukraine.* ★3 The Ukrainian people in the Russian and Austro-Hungarian empires. From serfdom to capitalism. The national movement and the making of the modern nation. Note: Formerly part of HIST 328.

HIST 337. *Twentieth Century Ukraine.* ★3 World War I and the emergence of the Ukrainian Republic. Ukrainian lands in the U.S.S.R. and Poland during the interwar period. World War II and Nazi occupation. Soviet Ukraine since 1945.

HIST 347. *English Constitutional History (Modern).* ★3 Note: Formerly part of History 351.

HIST 360. *American History.* ★6 A survey of United States history from colonial times to the present.

HIST 371. *The Canadian West to 1870.* ★3 A lecture course emphasizing the history of the prairie west but dealing as well with westward expansion and the north and with the transmountain west.

HIST 372. *The Canadian West Since 1870.* ★3

HIST 379. *The Native Aspect of Canada's History.* ★3 Canada's history as it relates to native peoples, from the beginning of the 16th century to the present. Prerequisite: A half course in Canadian history or consent of the Department. Note: ANTHR 350 or 355 strongly recommended.

HIST 384. *South Asia.* ★6 A survey of the history of the sub-continent of India from the Indus Valley civilization to the present.

HIST 387. *Canada's Relations with East Asia.* ★3 A survey of Canada's contacts with China, Japan, Korea, and Vietnam from the mid-nineteenth century to the present.

HIST 407. *Topics in Alberta History.* ★3 Selected economic, social and political topics with particular reference to the land and people of Alberta, beginning with native-white contact and extending to the present. Prerequisite: A previous course in Canadian history or consent of the Department.

HIST 426. *The Intellectual History of Russia Since 1762.* ★3

HIST 431. *Topics in the History of Modern France to 1789.* ★6

HIST 434. *Karl Marx, Historian.* ★3 The emphasis will be on Marx's historical method, as exemplified in such works as *The Class Struggles in France.*

HIST 439. *Germany Since 1933.* ★3

HIST 493. *Land and Labor in Latin America.* ★3 An examination of the history of labor utilization and its relationship to the various agricultural systems of Latin America. Prerequisite: HIST 391/392 or consent of the Department.

HIST 494. *Political and Social Revolution in Latin America.* ★3 An examination of political instability in Nineteenth Century Latin America and the circumstances surrounding social revolutions in Mexico and Cuba in the Twentieth Century. Prerequisite: HIST 391/392 or consent of the Department.

HIST 496. *Topics in Latin American History since 1850.* ★3 Prerequisites: HIST 391/392 or consent of the Department.

HIST 621. *Medieval Europe.* ★6

HIST 623. *Early Modern Western Europe.* ★6

HIST 625. *Modern Western Europe.* ★6

272.53 Industrial Relations

Faculty of Business Administration and Commerce

NOTE: The following courses are open only to graduate students who have the consent of the

See colored pages for times and sessions when courses are offered.

Associate Dean (Graduate), Faculty of Business Administration and Commerce.

IND R 471. *Unions, Managements, and the Public.* ★3

IND R 563. *Labour Relations.* ★3 An advanced study of collective bargaining including the theories of bargaining, negotiating techniques and the implications of public policy for collective bargaining. The seminar provides an opportunity for participation in simulated mediation of labour disputes. This course is not available to students who have taken IND R 411. Prerequisite: IND R 471 or equivalent.

IND R 564. *Collective Agreement Administration and Arbitration.* ★3 Examines the philosophy and the mechanics of third party intervention in industrial disputes. Evaluates the feasibility of dispute settlement methods in Canada, ranging from voluntary interest arbitration to compulsory rights arbitration. The seminar provides an opportunity for participating in simulated arbitration. Prerequisite: IND R 471 or equivalent.

272.54 Interdisciplinary Studies

Courses listed below are the concern of more than one discipline. Students may register in these courses either as options or as courses in subjects of concentration in one of the disciplines listed in the footnote under each course, subject to the usual curriculum requirements, prerequisites, etc. Instruction will be offered by members of one or more of the departments or faculties listed beneath the course description. *For the following Interdepartmental course descriptions, where the department responsible for registration has been assigned, the department so designated will appear in square brackets following the course description.*

INT D 302. *Economics of Agriculture.* ★3 The nature and scope of agricultural economics; economic aspects of agricultural production, marketing, finance, resource use, prices, and policy; relations of the agricultural sector to the economy as a whole; analysis of structural change, economic growth, and adjustment in agriculture. Prerequisites: ECON 201/202 or equivalent. (Offered jointly by the Departments of Economics and Rural Economy.) Note: Formerly INT D 367. Students register in the Department of Rural Economy.

INT D 346. *Introduction to Eastern Europe and the Soviet Union.* ★6 An interdisciplinary introduction to the study of the socialist system with special reference to the Soviet Union and East Europe. [Division of East European Studies and Departments of Comparative Literature, Economics, Geography, History, Political Science, Slavic Languages, Sociology.]

INT D 355. *Social Problems of Eastern Europe Under State Socialism.* ★3 The social, cultural and economic consequences of major structural transformation in east European societies with particular emphasis on family life, the socialization of youth, work relations, popular culture and social deviance.

INT D 369. *Economics of the Environment.* ★3 Economic growth and the deterioration of the environment; types and causes of environmental deterioration; theory, policy, and measurement relating to environmental deterioration; recreation economics; and current Canadian environmental topics. Prerequisites: ECON 201 or 304 or 307. [Departments of Economics, Rural Economy.] Students register in the Department of Economics.

INT D 393. *Political Sociology.* ★3 An examination of the impact of social organization and structure on the conduct of politics in mass societies, and of the ways the organization and structures of such societies are affected by political processes. Prerequisite: POL S 200 or 201 and 202; or SOC 202 or 403, or consent of the Department (either Political Science or Sociology). Students register in the Department of Political Science.

INT D 443. *The Soviet North and Siberia.* ★3 The economy, political administration, and the Soviet North. Prerequisite or corequisite: An area-related course in one of geography, political science, economics, or consent of the Division of East European Studies. [Division of East European Studies].

INT D 445. *Poland.* ★3 The political, social, economic, and cultural developments in post World War II. Prerequisite: INT D 346, or POLISH 304 or equivalent, or demonstration to the Division of East European Studies of sufficient background in the area. (Participating Departments to be announced later.) Students register in the Division of East European Studies.

INT D 446. *Eastern Europe: A Travel Study Course.* ★6 An intensive interdisciplinary study of Eastern Europe and the Soviet Union, in Eastern Europe itself. Designed to provide an understanding of the area by directed study on location. Note: The course is offered only in the Summer Session in countries of Eastern Europe and the USSR on a selected basis and includes intensive study in two countries. Prerequisite: INT D 346 or consent of the Division of East European Studies. Pre-session study and preparation. Students register through the Division of East European Studies. Note: (A) This course will be given in Poland and Yugoslavia during the Summer Session 1981 with instruction in English. Those interested may obtain additional information from Professor R. Busch, Division of East European and Soviet Studies. (B) A Letter of Permission will be needed by students applying from other universities to insure that proper credit will be given. If not currently enrolled in another degree program, please apply for Special Student status. The tuition fee will *not* be refunded except in cases of extreme distress. (C) Audit privileges are not extended to students in overseas courses. Students who do not wish credit can apply to the Dean for permission to register as Special Students and will pay the normal fee. (D) This course will be withdrawn unless there is a minimum of 15 students enrolled by May 8, 1981.

INT D 469. *Plans for Heritage Interpretation.* ★3 Survey of principles and practices at various levels of interpretative planning in historical/cultural and natural environments.

INT D 565. *Northern Studies.* ★3 An examination of current environmental research in the Canadian North. Seminars are presented by professionals engaged in various facets of northern research. Prerequisite: Consent of the Department. (Offered by the Boreal Institute for Northern Studies and the Department of Geography.) Students register in the Department of Geography.

272.55 Japanese

Department of History

JAPAN 201. *Conversational Japanese I.* ★3 Elementary level conversational Japanese language. Note: JAPAN 100 and 201 may not both be taken for credit.

JAPAN 202. *Conversational Japanese II.* ★3 Elementary level conversational Japenese. Prerequisite: JAPAN 201 or equivalent. Note: JAPAN 100 and 202 may not both be taken for credit.

272.56 Latin

Department of Classics

LATIN 100. *Beginners' Latin.* ★6 Essentials of Grammar, syntax, the reading of easy Latin and prose composition. Secondary emphasis on the connexion of English with Latin.

272.57 Law

LAW 300. *Law for Non-LL.B. Students I.* ★3 The nature, functions, and sources of law; an outline and components of the Canadian legal system. Note: Not available for credit in the LL.B. Program.

LAW 301. *Law for Non-LL.B. Students II.* ★3 Topics to be covered will be chosen from among the following: Morality, Obscenity and the Law; Industrial Relations; the

See colored pages for times and sessions when courses are offered.

Law and the Family; the Law as a Protector; Freedoms allowed under the Legal System; the Law and the Environment. Prerequisite: Normally, LAW 300 would be a prerequisite but this requirement may be waived at the discretion of the instructor. Note: Not available for credit in the LL.B. program.

LAW 302. *Law for Education Students I.* ★3 A thirty hour course involving introduction to the sources of law, legal history, the legal system and the role of law. A substantive area of law would be studied in depth to illustrate these matters more clearly. Topics covered would include—What is Law?, Sources of Law, Origins of Law, i.e., the development of the common law and its reception to Canada, The Canadian Legal System, The Relationship of Law and Society. Note: Not available for credit in the LL.B. Program.

LAW 303. *Law for Education Students II.* ★3 A course of thirty hours which would involve an examination of several substantive areas in law both to give the student a better understanding of the legal system and to enable the student better to teach law in the high school. Normally, LAW 302 would be a prerequisite for LAW 303 but this requirement could be waived at the discretion of the instructor. Note: Not available for credit in the LL.B. Program.

272.58 Legal Relations

LEG R 310. *Commercial Law.* ★3 An introduction to the Canadian legal system with emphasis on legal problems in commercial law.

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

LEG R 519. *Tax Factors in Business Decision Making.* ★3

LEG R 570. *Public Policy and the Canadian Managerial Environment.* ★3

272.59 Library Science

LIB S 412. *Storytelling.* ★3 To enable students to select, prepare, and present stories.

LIB S 423. *Archives Administration.* ★3 To develop an understanding of archival records and their role in the field of information.

LIB S 432. *Survey of Materials for Children.* ★3 To develop a knowledge and appreciation of materials for children in terms of their needs and interests.

LIB S 434. *Adult Materials.* ★3 To develop an awareness of the recreational, educational and professional library needs of adults (including the less specialized needs of the high school, college and university community), and of the materials available to meet the needs.

LIB S 436. *Humanities in the Library.* ★3 To understand the nature and function of the humanities and to be able to select, organize and effectively use the printed materials or objects relevant to the humanities. Prerequisite: LIB S 411.

LIB S 472. *Publishing.* ★3 To examine the organized business of writing, manufacturing and marketing books and other media.

LIB S 522. *Library Systems and Networks.* ★3 To consider models of systems and examples of library cooperation from the simplest to the most sophisticated. Prerequisite: LIB S 421.

LIB S 523. *Records Management.* ★3 To develop an understanding of records management.

LIB S 532. *Informational Materials for Children and Young Adults.* ★3 To survey information materials that children and young adults use and the ways in which these materials are used. Prerequisite: LIB S 432 or 433.

LIB S 557. *Special Topics in Librarianship.* ★3 A current topic or issue significant for librarianship or a special aspect of librarianship, may be examined, as demand and resources permit.

LIB S 571. *Automation and Libraries.* ★3 To develop students' ability to design, evaluate, and implement typical automated procedures related to library and information centre work. Prerequisite: LIB S 471.

272.60 Linguistics

LING 303. *Introduction to Linguistics.* ★3 Methods for the analysis of language: Phonetics, phonology (sound structure), morphology (word formation), syntax (sentence structure). This course is a prerequisite for most other courses in the Department.

LING 382. *Modern English Syntax.* ★3 Transformational description of English syntax. Prerequisite: LING 303 or consent of the Department.

LING 599. *Special Problems Course.* ★3

272.61 Management Science

MGTSC 306. *Probability and Statistics for Business Part I.* ★3 Introduction to probability; discrete and continuous random variables and probability distributions; expectation and variance; normal and binomial distributions; sampling; and sampling distributions for means and proportions; confidence intervals and tests of hypotheses for means and proportions; Bayesian decision theory. Prerequisite: MATH 240.

MGTSC 307. *Probability and Statistics for Business Part II.* ★3 Statistical inference for the variance; statistical inference for the means, proportions and variances from two populations; analysis of variance; non-parametric statistics; joint probability distributions; marginal and conditional distributions; covariance, correlation and independence; contingency tables; simple linear regression, multiple linear regression, nonlinear regression, and time series analysis. Prerequisites: MGTSC 306; MATH 243.

MGTSC 356. *Introduction to Management Science (Operations Research).* ★3 A problem-solving course designed to introduce the student to management science. The following topics are usually covered: history and overview of management sciences; linear programming including formulation of linear problems, simplex programming solution techniques, and sensitivity analysis; transportation and other network algorithms. Prerequisites: MATH 243, MGTSC 306, 357.

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

MGTSC 459. *Quantitative Decision Analysis Under Uncertainty.* ★3

MGTSC 461. *Management Science.* ★3

MGTSC 462. *Statistical Inference in Business.* ★3

MGTSC 501. *Seminar in Quantitative Methods in Business II.* ★3

272.62 Managerial Economics

MANEC 323. *Business Economics.* ★3 Intermediate microeconomics with business applications. The theory of consumer behavior, price and output determinations under various forms of competition; the allocation of resources; welfare economics. Prerequisites: ECON 201/2, and MATH 240. Credit will not be given for both MANEC 323 and ECON 381.

MANEC 333. *Aggregate Income Analysis.* ★3 The theoretical examination of the determinants of national income. Ways in which governments, consumers, and investors combine to determine income, employment growth, and stability. Prerequisites: ECON 201/2. Credit will not be given for both MANEC 333 and ECON 382.

MANEC 411. *International Business.* ★3 A course to acquaint students with the problems and opportunities arising when a firm operates in more than one country:

See colored pages for times and sessions when courses are offered.

the choice between operating abroad, export and licensing, the nature and causes of the emergence of new capital markets, international institutions facilitating export finance, commodity price stabilization programmes, the implications of commercial, tax and integration policy for business decisions, aspects of international management such as hedging of foreign exchange risk, transfer pricing and choice of optimal capital structure. Prerequisite: MANEC 312.

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

MANEC 463. *Managerial Economics.* ★3
MANEC 464. *Aggregate Income Analysis.* ★3
MANEC 556. *Urban Management.* ★3
MANEC 569. *Energy Industry Policy.* ★3

272.63 Reserved

272.64 Marketing

Faculty of Business Administration and Commerce

MARK 304. *Fundamentals of Marketing.* ★3 The evaluation of marketing in the economy. Marketing structure, organization and behavior; marketing functions. Prerequisites: ACCTG 204, LEG R 310, MANEC 323, 333, MGTSC 307, 357, and ORG T 303 and 305; or by consent of the Chairman of the Department of Marketing and Economic Analysis.

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

MARK 458. *Marketing Management.* ★3
MARK 561. *Marketing Research.* ★3
MARK 564. *Consumer Behavior.* ★3

272.65 Mathematics

MATH 202. *Elementary Calculus I.* ★3 Review of analytic geometry, differentiation and integration of simple functions, applications. Prerequisite: MATH 30 or equivalent. Note: Those students who have no knowledge of trigonometry are required to take MATH 101 concurrently. This course may not be taken for credit if credit has already been obtained in any of MATH 203, 207, 212 or 245.

MATH 204. *Elementary Calculus II.* ★3 Differentiation and integration of trigonometric, exponential and logarithmic functions. Intermediate forms and improper integrals. Techniques of integration. Appliications. Prerequisite: MATH 202 or 203, or 245 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either of MATH 208 or 213.

MATH 213. *Calculus II.* □5.0 Applications of integration to lengths, areas, volumes and masses. Transcendental functions. Methods of integration, polar coordinates, parametric equations. Vectors, vector functions and derivatives. Prerequisite: MATH 212 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in either MATH 204 or 208 (★4.).

MATH 221. *Linear Algebra I.* ★3 Solving linear equations, matrix algebra, determinants, n-space, linear programming. Prerequisite: MATH 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of MATH 243, 274, 278, 281 or 312.

MATH 222. *Linear Algebra II.* ★3 Bases, linear transformations, change of bases, eigenvectors, Markov processes. Prerequisite: MATH 221, or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 378 or MATH 381.

MATH 240. *Algebra and Elementary Calculus I.* ★3 Differential and integral calculus of algebraic, exponential and logarithmic functions with applications to problems in Business and Economics. Prerequisite: MATH 30 or equivalent. Note: This course is intended primarily for students registered in the Faculties of Business Administration and Commerce, Agriculture and Forestry, and Pharmacy and Pharmaceutical Sciences. This course may not be taken for credit if credit has already been received in any of MATH 202, 203, 207 or 212. Students who have taken MATH 31 should take MATH 242.

MATH 243. *Linear Algebra.* ★3 Vector and matrix notation, solving linear equations, vector spaces, matrix algebra, determinants, and applications to economics and commerce, including linear programming, marketing problems, and input-output analysis. Prerequisite: MATH 30 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in any of the following: MATH 274, 278, 312, 381. This course is required for all students in Business Administration and Commerce.

MATH 251. *Mathematics of Finance I.* ★3 Simple and compound interest, force of interest; applications. Certain annuities, simple and general. Perpetuities. Prerequisite: MATH 30.

MATH 302. *Intermediate Calculus I.* ★3 Vectors in space geometry, determinants, Cramer's rule, complex numbers, partial differentiation, multiple integration. Prerequiste: MATH 204 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 307 or 314.

MATH 303. *Intermediate Calculus II.* ★3 Infinite series, elements of linear differential equations, curves and tangent vectors, polar cylindrical and spherical coordinates, arc length and surface area. Prerequisite: MATH 302 or equivalent. Note: This course may not be taken for credit if credit has already been obtained in MATH 308.

MATH 315. *Calculus III.* □3.0 *Partial differentiation, derivatives of integrals. Multiple integration using rectangular, cylindrical and spherical coordinates. Vector Field Theory. Prerequisite: MATH 213 or equivalent.* (★3)

MATH 375. *Geometry I.* ★3 Sensed Magnitudes. Cross rates. Transformation theory. Prerequisite: MATH 30 or consent of the Department.

MATH 415. *Applied Algebra I.* ★3 Boolean Algebra. Switching circuits, graph theory, matrix representations; applications to economics, communication networks and social science. Prerequisite: a single-term course in linear algebra or consent of the instructor.

272.66 Medical Bacteriology

Faculty of Medicine

BACT 530. *Biological Techniques in Electron Microscopy.* ★3 Biological techniques in Electron Microscopy with special emphasis on those which apply to medical microbiology. The course will include theory and use of the electron microscope, preparation of microbiological and biological material for examination by electron microscopy using various basic techniques, photography and other related topics. Prerequisite: A university course in basic Biology or Microbiology and consent of the Department of Medical Bacteriology.

BACT 531. *Advanced Biological Techniques in Electron Microscopy.* ★3 Advanced biological techniques in Electron Microscopy with special emphasis on those which apply to medical microbiology. The course will include an extension of techniques covered in Bacteriology 530 and will include more advanced techniques of specimen preparation and use of the electron microscope. Prerequisite: BACT 530 (or adequate previous experience in electron microscopy of biological materials) and consent of the Department of Medical Bacteriology.

See colored pages for times and sessions when courses are offered.

272.67 Meteorology

Department of Geography

METEO 320. *Meteorological Instrumentation.* ★3 Theory and practice in the use of common meteorological instruments and in the interpretation of basic weather and climatological data with emphasis on applications in agriculture, forestry, biological and environmental sciences. Measurement problem definition, sampling, sensitivity, response, accuracy, data logging, station networks. Laboratory and outdoor demonstrations and exercises. Field trips required. Prerequisite: Geography 231 or equivalent.

272.68 Movement Education

MOV 201. *Introduction to the Movement Activities of Children Aged 0-8.* ★3 A study of children at play and other movement activities including games, gymnastics and dance for children.

MOV 202. *Introduction to the Movement Activities of Children Aged 8-12.* ★3. A study of games, gymnastics, dance and other movement activities for children.

MOV 244. *Introduction to the Movement Activities of Youth, Part I.* ★3 A study of a wide range of physical activities and the related underlying concepts.

MOV 245. *Introduction to the Movement Activities of Youth, Part II.* ★3 A continued study of physical activities and the related underlying concepts. Prerequisite: MOV 244.

MOV 301. *Motor Development and Motor Learning.* ★3 Lecture course focusing on important relationships between physical growth and development, and environmental factors that influence the acquisition of motor skills.

MOV 321. *Structure and Strategy of Games.* ★3 A study of games; their classification with regard to skills, rules and strategies through practical and theoretical experiences.

MOV 325. *Introduction to the Scientific Basis of Human Movement.* ★3 Lecture course with emphasis on introductory knowledge and practical implications of the structural and functional characteristics and capacities of the human body with respect to movement.

MOV 351. *Educational Gymnastics.* ★3 Gymnastics themes are studied and used to develop efficient movement through practical work in individual and group situations.

MOV 427. *A Study of Dance for Children.* ★3 A study in depth of the three interrelating components of children's dance: the child as the creator, performer and spectator. Opportunities to observe, work with and perform for children will be provided. Prerequisites: One or more of MOV 201, 202, 327, 423, DANCE 270 or consent of the Department.

272.69 Music

MUSIC 200. *Rudiments of Music.* ★3 Fundamentals of music theory approached through aural and written training. Note: Not open to B.Mus. students.

MUSIC 206. *Introduction to Music I.* ★3 Definition of terms; forms and styles in music from Baroque through Classical periods. Listening to recorded examples. Note: Open to all students not eligible for MUSIC 202, 203, 301, 304 or 402.

MUSIC 207. *Introduction to Music II.* ★3 The Romantic period to the present. Familiarity with the concert repertoire. Note: Open to all students not eligible for MUSIC 202, 203, 301 or 402.

NOTE: The ability to read music is required for all courses listed below.

MUSIC 301. *History of Classical Music.* ★3 Prerequisite: MUSIC 200 or satisfactory completion of Department of Music Theory Placement Examination for other than B.Mus. students.

272.70 Nursing

NURS 305. *Health Assessment of Adults and Children.* ★3 Focus is on components of the health history and physical examination of well adults and children (older than one month of age). Prerequisite: NURS 243, P ED 204, PHYSL 261.

NURS 325. *Introduction to Nursing of Individuals with Health Deviations.* ★3 This course emphasizes development of nursing assessment and assiting technologies in relation to clients whose self-care agency is modified by behavioral and organic deviations. The focus of the course is on modifications in nurse and client agency which arise from selected organic and behavioral deviations. Prerequisite: NURS 321, 333 and 334.

NURS 464. *Nursing of Clients with Health Deviations III.* ★6 This course is a concentrated learning experience in the nursing care of individuals and/or groups with complex behavioral and organic deviations. All nursing systems will be utilized. No other course can be taken concurrently. Prerequisite: NURS 327, 425, 426.

NURS 467. *Interpersonal Skills for the Promotion of Self-Care.* ★4 Emphasis will be on the nurses' use of self and communication for the promotion of self-care. The self-care framework will be applied to the nursing of individuals with either universal or health deviation self-care requirements in a variety of settings. Prerequisite or corequisite: NURS 466.

NURS 468. *Assessment of Self-Care of Individuals.* ★4 Emphasis will be on technologies for health assessment of individuals of all ages. The self-care framework of nursing practice will be applied to nursing of individuals with universal self-care requirements in a variety of settings. Prerequisites: NURS 466 and 467. Prerequisite or corequisite: OCCTH 319 and PHYSL 261 or 262.

NURS 485. *Senior Nursing Practicum.* ★4 A clinical experience which will provide the student with the opportunity to nurse a client(s) of choice. Throughout the practicum the student will be expected to demonstrate competency in technical skills as well as scholarly behavior. Clients chosen for this in-depth study will be determined by available resources. Prerequisite: Basic nursing students must take this course in the fourth year.

272.71 Occupational Therapy

Faculty of Rehabilitation Medicine

OCCTH 207. *History, Systems and Resources of Rehabilitation.* ★3 Development and organization of major services for the handicapped. Legal, educational and governmental influences on these services. The role of the O.T. in the overall system; models of O.T. service.

OCCTH 208. *Introduction to Occupational Therapy Theory and Practice in Psychiatry.* ★3 Basic theory of program development; implementation and evaluation in psychiatric O.T. services. Introduction to clinical disorders in psychiatry. Use of communication techniques and interpersonal skills. Presentation of case studies to illustrate principles.

OCCTH 319. *Life Span Development.* ★3 The study of the development of the child to maturity, the changing periods of adulthood and the significance of the aging process. Study will include both physical and psychosocial factors as they relate to occupational therapy.

OCCTH 405. *Research Theory in Occupational Therapy.* ★3 Lectures and discussion on the theory of research design procedures and their application to Occupational Therapy. Prerequisite: An approved introductory Statistics course or the consent of the Department.

OCCTH 406. *Applied Research Design in Occupational Therapy.* ★3 Seminar presentations which directly applies research design to ongoing research in occupational therapy. Students will design a clinical research project and present the proposal in class. Prerequisite: OCCTH 405 or consent of the Department. An approved introductory statistics course.

See colored pages for times and sessions when courses are offered.

OCCTH 498. *Special Seminars.* ★3 Content varies from year to year. Topics will be announced prior to registration period. Prerequisite: Consent of the Department.

OCCTH 498. *Special Seminars: Learning Disorders of Children.* ★3 This course is designed as an introduction to disorders of basic cognitive processes such as attention and memory, and their effects on learning. Diagnostic indicators of these disorders and various intervention strategies appropriate to the rehabilitation setting will be reviewed. The course format will consist of lectures and seminars. Students will be responsible for one review paper and a brief class presentation.

OCCTH 498. *Special Seminars: Remedial Use of Hatha Yoga in Occupational Therapy.* ★3 This course will introduce participants to the use of Hatha Yoga in O.T. programs for psychosocial and physical dysfunction. Classes will include daily practical sessions and seminars. Open to occupational therapists and senior undergraduate students in the U. of A. Occupational Therapy Department.

OCCTH 498. *Special Seminars: Use of the Creative Arts in Therapy.* ★3 This course will introduce participants to the use of dramatherapy within therapeutic settings. Participants will be involved in practical sessions including movement, mime, role playing, simulation games, and improvisation. Admission will be by consent of the Department. The course is offered in conjunction with the Faculty of Physical Education and Alberta Culture.

272.72 Organizational Analysis

NOTE: The following courses are open only to graduate students who have the consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

ORG A 470. *The Individual in Groups and Organizations.* ★3

ORG A 472. *Organization Theory and Administrative Practice.* ★3

ORG A 552. *Selected Topics in Behavioral Sciences.* ★3

ORG A 557. *Advanced Seminar in Personality and Organizations.* ★3

ORG A 565. *Seminar in Personnel Administration.* ★3

272.73 Organization Theory

Faculty of Business Administration and Commerce

ORG T 303. *Behavior in Organizations.* ★3 Examines the sociological and psychological bases of individual behavior in organizations. Topics of individual psychology examined will include cognition, perception, attitude formation and change, personality structure and change, and motivation. The course will also investigate the behavior of individuals in groups and organizations. In this context various aspects of group dynamics such as leadership, communication, interpersonal sensitivity, morale and satisfaction, and the formation and attainment of individual and group goals will be discussed.

ORG T 305. *Theory of Formal Organization.* ★3 An examination of the structural and functional imperatives of formal organizations. Formation, structure, and change in complex organizations including bureaucratic, matrix, and process-oriented types of organizational design. Power, authority, and legitimacy variables are examined using anthropological and sociological methodological constructs.

ORG T 421. *Theory and Practice of Personnel Administration I.* ★3 Philosophy and procedures in obtaining and maintaining an efficient work force with emphasis on the methods of initiating and carrying out an effective manpower management program. Includes recruitment, selection, utilization, and development of human resources. Prerequisite: ORG T 303, 305, or equivalent.

ORG T 441. *Selected Topics in Organization Theory and Behavior.* ★3 Topics dealt with in this seminar may vary from year to year, and will be chosen at the discretion of the instructor. Prerequisite: Consent of the instructor.

ORG T 445. *Individual Research Projects.* ★3 Special study for advanced undergraduates. Prerequisite: Consent of instructor and Associate Dean. (When a student registers in this course for a second, third, fourth or fifth time subsequent higher course numbers are to be used, ORG T 446, 447, 448 and 449.)

272.74 Philosophie/Philosophy

Faculté St. Jean

PHILE 354. *Ethique.* ★6 Ce cours porte sur la notion de la moralité et expose les diverses théories concernant la morale. On y traitera de l'homme de bien; de la vie moralement bonne; des critères selon lesquels on porte un jugement moral sur les actions des hommes; de la signification des termes utilisés en morale et de la justification des jugements moraux en les liant aux théories, telles l'egoisme, l'hedonisme, le subjectivisme, le relativisme et l'utilitarisme.

272.75 Philosophy

Except where noted, there are no formal prerequisites for 300-level courses; however, students will find it valuable to have taken a previous philosophy course such as 230, 239 or 240.

PHIL 221. *Practical Logic.* ★3 Elementary methods and principles for distinguishing correct from incorrect reasoning. Topics may include informal fallacies, introduction to scientific method, elementary formal logic, rational decision procedures, and analysis of arguments.

PHIL 230. *Problems of Philosophy.* ★3 Some of the central issues of philosophy. Topics such as freedom and determinism, the concept of a person, mind and body, the existence of God, the nature of goodness, justice and value, the nature of knowledge, belief and truth, the problems of scepticism and knowledge in regard to ourselves, other persons and the external world.

PHIL 239. *Philosophical Analysis of Contemporary Issues.* ★3 Philosophical analysis of contemporary problems of social concern. Topics such as minority and majority rights, cultural preservation, war and violence, censorship, medical ethics, abortion, sexual equality, our place in the natural environment.

PHIL 302. *Philosophy of Man.* ★3 A study of man: His organic existence, his knowledge, his intellectual and emotional love. Not open to those who have taken PHIL 330.

PHIL 303. *Man in Society.* ★3 A study of the person in relationship with others: The notions of law, right, duty, community.

PHIL 323. *Philosophy of Mind.* ★3 Approaches to the question of what it means to be a person and have a mind. The relationship of philosophical ideas to scientific investigations of mental phenomena will be studied. Specific topics include: personal identity, memory, imagination, intention, desire, emotion and sensation, the mind-body relationship.

PHIL 465. *Theory of Knowledge.* ★3 Recent conceptions of knowledge, and related questions concerning perception, memory, justification and truth. Prerequisite: PHIL 322 or consent of the Department.

PHIL 512. *Marx and Marxism.* ★3 or ★6

PHIL 536. *Phenomenology I.* ★3

PHIL 537. *Phenomenology II.* ★3

PHIL 559. *Topics in Philosophy of the Social Sciences.* ★3

PHIL 563. *Epistemology I.* ★3

272.76 Physical Education

P ED 204. *Structural Anatomy.* ★3 A regional survey of the human body as it relates to the development of human movement. (For B.P.E. and Nursing students only.)

See colored pages for times and sessions when courses are offered.

P ED 210. *Physical Fitness Theory and Practice.* ★3 Knowledge and understanding of basic concepts of fitness and nutrition with practical application geared to individual needs.

P ED 211. *Introduction to Basketball.* ★3 The theory, practice, and teaching of the fundamental skills of basketball.

P ED 215. *Introduction to Soccer.* ★3

P ED 216. *Introduction to Volleyball.* ★3

P ED 223. *Boating.* ★3 Introduction to the popular small water craft of Western Canada. Emphasis is generally on the open Canadian canoe but may vary from year to year.

P ED 225. *Introduction to Gymnastics.* ★3

P ED 227. *Introduction to Aquatics.* ★3 This course is designed for non-swimmers. Those with a level of swimming beyond Junior Red Cross should register in P ED 327. Those beyond the appropriate level of competence may be asked to withdraw from this course if inappropriately registered.

P ED 228. *Introduction to Track and Field I.* ★3 Sprinting, relay racing, hurdling, distance running, shot putting, discus throwing, long jumping, flop-style high jumping, and related strength training.

P ED 229. *Introduction to Track and Field II.* ★3 High jumping (straddle-style), triple jumping, pole vaulting, javelin throwing, hammer throwing, sprinting, and related strength training.

P ED 231. *Court Sports.* ★3 Selection will be made from handball, racquetball, and squash. Students must purchase own equipment.

P ED 234. *Introductory Golf.* ★3

P ED 236. *Racquet Sports.* ★3 Tennis.

P ED 240. *Adapted Physical Education.* ★3 A survey of handicapping conditions and methods of adapting physical activity programs.

P ED 309. *Project.* ★3 An individual or group research or field project focussed on the adaptation effects of sports and physical activities. (For B.P.E. students only.) Prerequisite: P ED 209.

P ED 327. *Advanced Aquatics.* ★3 This course is designed to introduce the swimmer to advanced stroke techniques and lifesaving skills. RLSS Bronze Certificate may be achieved. Prerequisite: P ED 227 or equivalent. Enrollment is limited to those persons who have not achieved a status higher than a bronze medallion (i.e. instructor's, NLS, Award of Merit, etc.).

P ED 360. *Coaching Practicum.* ★3 A practical introduction to coaching under the direction of an approved coach. Prerequisite: P ED 260 or consent of the Department. (For B.P.E. students only.)

P ED 382. *Warm Weather OUtdoor Education.* ★3 An indepth study of the physical skills, background knowledge, organizational skills, and basic pedagogy of the popular self-propelled warm weather recreational pursuits. An in-camp practicum is required. Prerequisite: P ED 280, or REC 280, or consent of the Department. Note: A user's fee of $10.00 is charged for maintenance of equipment. Additional costs include transportation, food and accommodation for off-campus trips.

HE ED 391. *Health Education in Secondary Schools I.* ★3

P ED 391. *Practicum in Conditioning Methods and Training Techniques.* ★3 Open to third and fourth year B.P.E. students only.

P ED 401. *Sociology of Sport.* ★3 The characteristics, processes, and problems of sport as a social system with particular reference to North American society.

P ED 409. *Project.* ★3 An individual or group research or field project focussed upon the socio-cultural processes affecting an individual's participation patterns in physical activities. (For B.P.E. students only.) Prerequisite: P ED 209.

P ED 440. *Practicum in Physical Education for the Physically Disabled.* ★3 Supervised experience in physical activity programs for the physically disabled. Prerequisite: P ED 240 or consent of the Department. (For B.P.E. students only.)

P ED 460. *Advanced Coaching Practicum.* ★3 Advanced coaching experience under the direction of or in association with an approved coach.

P ED 499. *Directed Studies.* ★3 Wilderness arts, crafts and living skills. Prerequisite: consent of the Department.

P ED 544. *Popular Physical Culture and Social Interaction.* ★3

P ED 551. *Administrative Problems in Sport and Physical Education and Recreation.* ★3

P ED 553. *Administration of Sport and Physical Education Programs.* ★3

P ED 561. *Seminar in Biomechanics.* ★3

P ED 569. *Physical Growth and Development.* ★3 An examination of selected topics in physical growth and motor development from both a theoretical and applied perspective.

P ED 573. *Adapted Physical Education.* ★3 Seminar on current theoretical, practical and research issues related to program implementation in adapted physical education.

P ED 589. *Cross-Cultural Comparative Analysis of Physical Education.* ★3 An examination of physical education programs in selected cultures with emphasis on the ramifications for Canada.

P ED 599. *Directed Studies and Research.* ★3

P ED 653. *Physiological Factors Affecting Performance.* ★3

P ED 655. *Energy Mobilization and Training.* ★3 Cellular adaptations to acute and chronic exercise. Discussion of metabolic and structural adaptations during exercise.

P ED 695. *Advanced Seminar in Biomechanics.* ★3

P ED 699. *Directed Studies and Research.* ★3

272.77 Physical Science

Department of Physics

PH SC 341. *Physical Science.* ★6 A course designed to give non-science students some appreciation of fundamental ideas and methods in the physical sciences, their history and development, modern trends in these fields, and their relation to other disciplines. Illustrative material will be taken from Physics, Chemistry, Astronomy, and Geology.

272.78 Physical Therapy

PTHER 311. *Biomechanics in Physical Therapy.* ★3 Biomechanical principles and techniques with some applications to physical therapy.

PTHER 463. *Management of Physical Therapy Services.* ★3 Problems involved in the planning development, organization, and administration of physical therapy services.

PTHER 468. *Sports Therapy.* ★3 An introduction to the prevention and care of sports injuries including the adoption of therapeutic exercise to the highly trained individual.

PTHER 469. *Research Methods in Physical Therapy.* ★3 The principles of scientific method, and their application to physical therapy in laboratory and clinical settings. (May be taken in partial fulfillment of approved elective requirements.)

PTHER 480. *Respiratory Conditions.* ★3 An advanced course in the pathophysiology, assessment and treatment of patients with respiratory conditions.

PTHER 482. *Assessment and Treatment of Peripheral Joints.* ★3 The assessment of problems affecting the peripheral joints, and their assessment and treatment by manual techniques. Not open to students with credit for PTHER 461.

PTHER 484. *Assessment and Treatment of Joints.* ★3 The assessment and treatment by manual techniques of peripheral and vertebral joints. Not open to students with credit for PTHER 461, PTHER 482, or PTHER 483.

272.79 Physics

PHYS 304. *Revolutions in Physics.* ★6 Discussion of the way scientists were forced to change their concepts that caused the major revolutions in physics and the accom-

See colored pages for times and sessions when courses are offered.

panying reverberations in the non-scientific world. Illustrations from celestial motion, Newtonian synthesis, theory of relativity, the probabilistic nature of quantum mechanics. Prerequisite: First year physics course(s) (two-term).

272.80 Physiology

PHYSL 262. *Elementary Physiology.* ★6 Available only to students in Faculty of Rehabilitation Medicine and Faculty of Nursing.

PHYSL 507. *Thermoregulation and Energy Exchange.* ★3 A series of lectures which deal with concepts of thermoregulation. The contributions of various original researchers on species, including man, are reviewed. Prerequisite: Introductory Physiology and consent of instructor.

272.81 Political Science

POL S 201. *Introduction to Government.* ★3 An introduction to the institutions of Canadian and other democratic governments, considering constitutions, legislatures, executives, the public service, courts, federal and other divisions of government authority and other selected topics. Note: Formerly part of POL S 200.

POL S 202. *Introduction to Politics.* ★3 An introduction to the process of democratic politics considering power, or influence, democracy, civil liberties and rights, political ideology, public opinion, elections, political parties, interest groups and other selected topics. Note: Formerly part of POL S 200.

POL S 300. *Comparative Political Systems.* ★6 Comparative analysis of seledted major political systems of the present day, with emphasis on the relationships between political functions and social processes. Note: Designed primarily as an introductory course at the senior level.

POL S 312. *Ethics and Politics.* ★3 The relationship between contemporary ethical theory and normative political analysis.

POL S 320. *Canadian National Government and Politics.* ★6 The structure and function of the government of Canada, especially of the Commons, Senate, Cabinet System, Civil Service, and the role of political parties. Note: Not open to students who have taken POL S 321.

POL S 321. *Canadian Government.* ★3 The structure and function of the government of Canada, provincial governments and local governments. Note: Designed primarily for students who want one senior course in Political Science. Not open to students who are taking or have taken Political Science 200 or 320.

POL S 322. *Local Government and Administration.* ★3 The structure and functions of local government in Canada with primary emphasis on the Province of Alberta. Note: Designed primarily for students who want one senior course in political science. Not open to students who are taking or have taken POL S 323.

POL S 325. *Topics in City Politics.* ★3 A detailed examination os specific municipal policies. Topics will vary annually. Prerequisite: POL S 322 or 323, or 324.

POL S 326. *Canadian Foreign Policy.* ★6 Major trends and development in Canadian foreign policy since 1919 with primary emphasis on the period since 1945. Note: No formal prerequisite, but a course or the equivalent in 20th Century Canadian history would be desirable.

POL S 328. *Elements of Public Administration.* ★3 Topics include government organization, budgets, policy-making, and democratic control and accountability. The focus is on Canada, but other countries are also considered.

POL S 363. *Issues in International Politics.* ★3 Contemporary issues of conflict and cooperation. Note: Designed primarily for students who want one senior course in political science. Not open to students who are taking or have taken POL S 361 or 362.

POL S 390. *Introduction to Political Behavior.* ★3 An introduction to political behavior as exhibited in both the public and private political world of the individual. Note: Formerly a full-session course.

POL S 410. *Topics in Contemporary political Philosophy I.* ★3 A critical examination of contemporary trends in political philosophy.

POL S 422. *Canadian Public Policy.* ★3 Analysis of Canadian public policy including policy formation and implementation. Attention will be given to specific policy areas such as health and welfare, the economy, agriculture and communication.

POL S 431. *Administrative Behavior.* ★3 A study of decision-making, integration and conflict resolution within government and bureaucratic organization, and of the responsiveness and effectiveness of these organizations, with specific reference to Canada.

POL S 458. *Foreign Policy.* ★3 The foreign policies and strategies of the "major" powers of the world.

POL S 469. *United Nations.* ★3 The history, constitutional structure and problems, and the effectiveness of social economic and political policies of the United Nations.

POL S 475. *Politics of Contemporary Soviet Ukraine.* ★3 Post revolutionary politics and ideologies, with special attention to administrative, institutional and constitutional changes, the nationalities problems and intellectual dissent.

POL S 493. *Politics and the Film.* ★3 The study of the motion picture both as propaganda and as political document. Prerequisite: INT D 300 is strongly recommended as prerequisite or corequisite.

POL S 502. *Logic of Political Inquiry.* ★3

POL S 510. *Advanced Study of Political Thought.* ★6

POL S 511. *Topics in Normative Analysis.* ★3

272.82 Psychologie/Psychology

Faculte St. Jean

PSYCE 489. *Psychologie de l'anormalité.* ★3 Introduction générale. Prérequis: PSYCE 202 ou 283 et 341.

272.83 Psychology

NOTE: Students with credit in PSYCO 202/212, or ED PSY 269/271 may not take PSYCO 237, 241, 260, or 261 for degree credit. PSYCO 261 replaces PSYCO 237, 241 and 283.

PSYCO 260. *Basic Psychological Processes.* ★3 Principles and development of perception, motivation, learning and thinking and their relationship to the psychological functioning of the individual. This course is a prerequisite for most courses in the Department and is normally followed by PSYCO 261.

PSYCO 261. *Individual and Social Behavior.* ★3 Introduction to the study of human individuality, personality, and social psychological processes. Some aspects of normal and abnormal human development, psychological assessment and treatment may be included. Prerequisite: PSYCO 260.

PSYCO 321. *Psychology Applied to Business and Industry.* ★3 Methods and results of psychological studies in such fields as: selection, placement, training and supervision of personnel; promotion of efficiency and safety in production; advertising, selling and consumer research. Prerequisite: PSYCO 309.

PSYCO 337. *Individual Differences.* ★3 A survey of the biological and social conditions contributing to variations among individuals; methods for describing individuality. Prerequisite: PSYCO 260/261 or equivalent and 309.

PSYCO 341. *Social Psychology.* ★3 An advanced course in social psychology. There may be an in-depth investigation of one or more of the following topics: socialization, attitudes, person perception, aggression, or group processes. Prerequisite: PSYCO 260/261 or equivalent. Note: PSYCO 341 and SOC 341 may not both be taken for credit.

PSYCO 353. *Developmental Psychology.* ★3 Behavior as it is related to normal development and aging. Prerequisite: PSYCO 260/261 or equivalent.

See colored pages for times and sessions when courses are offered.

PSYCO 361. *Principles of Behavior Change.* ★3 An introduction to behavior change techniques. The course will examine the origin of such techniques in animal experimentation and learning theory, and an evaluation of their effectiveness when applied to specific problem populations. Prerequisite: PSYCO 260. Note: Students cannot receive credit for both PSYCO 365 and 361.

PSYCO 383. *Personality.* ★3 An introductory survey including representative theoretical points of view and research relevant to the major problems of the study of personality. Prerequisite: PSYCO 260/261 or equivalent.

PSYCO 489. *Abnormal Psychology.* ★3 A general introduction. Prerequisite: PSYCO 383.

272.84 Recreation Administration

REC 390. *Outdoor Programming and Counselling.* ★3 Examination of the range and depth of recreation experiences inherent in selected outdoor activities and settings, and their implications for direct programming and counselling. Note: A user fee of $10 is charged for maintenance of equipment. A fee of up to $40 per student will be charged to contribute to field trip expenses. Prerequisite: REC 280 (or P ED 280).

REC 435. *Outdoor Recreation Resources.* ★3 Ethics of land use; patterns and trends in outdoor recreation; extent of outdoor resources for recreation use; characteristics of wilderness users; resource allocation and development by provincial agencies; and public participation in the decision-making process for resource allocation. Prerequisite: REC 301.

REC 489. *Selected Topics.* ★3 Topics of current interest in leisure and recreation.

REC 531. *Socio-Psychological Dimensions of Recreation Involvement.* ★3 Examinations of personal and situational factors related to involvement in recreation pursuits. Emphasis upon the general nature of the recreation experience and the significant factors affecting it.

REC 551. *Public Recreation Services Policy and Planning.* ★3 Examination of policy making and planning processes as they relate to the delivery of public recreation services in Canada. Draws upon the theoretical base of political science, upon decision making theories and upon the principles of planning in analysing policies and plans in the public recreation field.

272.85 Religious Studies

RELIG 200. *Introduction to the Study of Religion.* ★6 The origin and development of the history of religions as a separate academic discipline. Principles and methods of this discipline. Some account of the major living religions in their history and distinctive features.

RELIG 300. *Introduction to the Religions of the East.* ★6 An introductory survey of the religions of India, China, Japan, South-East Asia, including some account of the growth in the appreciation of the religions by the West and the interrelationship of cultural values of East and West.

RELIG 338. *Judaism and the Jewish People.* ★6 The history of Judaism and of the Jewish people from Second Temple through World War II. Formerly RELIG 340.

RELIG 351. *Synoptic Gospels.* ★6 A comparative and historical analysis of the purpose, characteristics, and problems of the first three gospels.

RELIG 360. *The Concept of Deity.* ★6 Different concepts of God as found in the major religions of the world.

RELIG 361. *Religious Symbolism.* ★3 A comparative study of religious symbols in the various religions of the world; primitive, classical and modern. Attention will be given to different approaches and methods.

RELIG 363. *Religious Founders.* ★3 An examination of the lives of the founders of the world's major religious traditions with special attention to their interpretation in devotional literature.

RELIG 365. *Comparative Studies in Religious Mythodology.* ★3 An introduction to the modern study of religious mythodology in several cultures. Focus on some major mythic themes such as creation, origin of death, etc.

RELIG 390. *Modern Religious Perspectives.* ★3 Contemporary problems in religious ethics and their impact on collective decision-making in the areas of politics, medicine, law, etc.

272.86 Russian

Department of Slavic Languages

RUSS 106. *Intensive Beginners' Russian I.* ★3 An 'immersion' course designed to give a working knowledge of Russian, with emphasis on conversational skills. Note: This course is given during the Summer Session only.

RUSS 107. *Intensive Beginners' Russian II.* ★3 The continuation of RUSS 106. Prerequisite: RUSS 106 or consent of the Department. This is a Summer Session course given in the Soviet Union.

272.87 Sociology

SOC 202. *Introductory Sociology.* ★6 An analysis of the nature of society, the interrelationships of its component groups, and the processes whereby society persists and changes. Society analysed in terms of its structure, culture, and social ranking schemes. The interrelationships between the various institutions (e.g. family, church, school, government). The processes whereby the individual is socialized into society, the sources of conformist and nonconformist behavior. Note: Third-year or more advanced students are encouraged to take SOC 403 rather than 202.

SOC 301. *Sociology of Sex Roles.* ★3 Comparative study of sex roles in selected societies with an emphasis upon contemporary Canada; sex-specific role behaviors and theories regarding their origin; recent sociological research on the social effects of sex roles.

SOC 311. *Statistics and Social Research.* ★6 Research design, data collection, and data processing in the social sciences. Logic and interpretation of statistical concepts and methods, measures of central tendency, variability and relationships; sampling and tests of hypotheses. Techniques of social measurement, experimental design, and introduction to scaling.

SOC 321. *Sociology of Social Problems.* ★3 A review of several macro-sociological perspectives focusing on such topics as population, ecology, social and economic inequality, intergroup relations, nationalism, collective violence and the sociology of social intervention. Note: Not available for credit to students with credit in SOC 320, 322, or 324.

SOC 322. *Canadian Social Issues.* ★3 Issues in such institutional areas as economy, authority, social class, collective values and education; programs of selected regional, ethnic and national interest groups; implications for other segments of Canadian society. Note: Not available for credit to students with credit in SOC 320 or 321.

SOC 323. *Sociology of Poverty.* ★3 The origins, meaning and effects of poverty, with special emphasis on Canada; theoretical perspectives on poverty; examination of poverty from various institutional perspectives such as education, health, law and housing; evaluation of poverty programs.

SOC 324. *Sociology of Deviance and Conformity.* ★3 Processes involved in defining behavior patterns as deviant; factors which influence conformity and change; examination of such behavior patterns as sexuality, alcoholism, drug use, and selected mental and physical disabilities; public reaction to such behavior. Note: Not available for credit to students with credit in SOC 320 or 321.

SOC 325. *Criminology.* ★3 Examination and attempted explanation of crime and juvenile delinquency, with an analysis of the social processes leading to criminal behavior.

See colored pages for times and sessions when courses are offered.

SOC 327. *Criminal Justice Administration.* ★3 The evolution and evaluation of the theories of punishment; the law, the police and the courts; penal and reformatory institutions; probation and parole; experiments in reform and rehabilitation. Prerequisite: SOC 325.

SOC 332. *The Development of Sociology I.* ★3 A survey of the origin and the development of classical sociological theory, with particular emphasis on Comte, Spencer, Marx, Durkheim and Toennies. Prerequisite: SOC 202 or 403.

SOC 333. *The Development of Sociology II.* ★3 A survey of the contributions of modern and contemporary sociological theorists, particularly Weber, Pareto, Parsons, Mead and others. Prerequisite: SOC 332.

SOC 341. *Social Psychology.* ★3 An introduction to the study of individual and group behavior observed in social processes. Prerequisite: SOC 202 or 403 or PSYCO 260/261 or ED PSY 269/271. Note: SOC 341 and PSYCO 341 may *not* both be taken for credit.

SOC 342. *Socialization.* ★3 Socio-cultural influences on the development of the self, from infancy through old age. Prerequisite: SOC 341.

SOC 344. *Public Opinion and mass Communication.* ★3 The nature of public opinion; factors involved in its assessment and its formation. The role of the media of mass communication. Prerequisite: SOC 341 or PSYCO 341.

SOC 351. *Population Concerns.* ★3 Population trends and problems in Canada and the rest of the world; social and cultural factors underlying fertility, mortality, and migration patterns and differentials; their relationship to the "population explosion", population composition and distribution; basic population methodology; ecological theories and processes; urbanization; population theory and policy.

SOC 353. *Urban Sociology.* ★3 Social implications of urban life with respect to such topics as patterns of city growth; urban social organization (family, neighborhood, community); urban social issues (housing, crime); urban policy and urban planning (sociology of planning, citizen participation). Prerequisite: SOC 202 or 403 or consent of the Department.

SOC 361. *Social Organization.* ★3 Social systems, their components, interrelations, and the bases of social differentiation and integration. Prerequisite: SOC 202.

SOC 368. *Canadian Ethnic and Minority-Group Relations.* ★3 Analysis of social processes leading to the development and understanding of minority status: case studies of ethnic and minority-group relations, with reference to cross-national studies. Prerequisite: SOC 202 or 403.

SOC 371. *The Family.* ★3 Structure and function of the family system, historically and cross-culturally. The family system in contemporary societies emphasizing its institutional characteristics and current trends. Prerequisite: SOC 202 or 403.

SOC 373. *Social Psychology of Health and Illness.* ★3 Social psychological factors in health and illness and medical care, including attitudes, beliefs, roles, socialization, and interpersonal processes. Prerequisite: SOC 202 or 403.

SOC 374. *Social Organization of Health Care.* ★3 The social structure and dynamics of health care organization, including hospitals, professional-bureaucratic relations in health care organizations, professional socialization, and governmental functions. Prerequisite: SOC 202 or 403.

SOC 375. *Sociology of Aging.* ★3 Aging as a socio-cultural phenomenon, includes aging in relation to the self-concept, family, religion, politics, health, retirement and leisure, housing, attitudes toward death, with particular emphasis on North American society.

SOC 377. *Sociology of Youth.* ★3 The comparative analysis of youth in various types of societies, with special emphasis on Canada including investigation of social structures and processes influencing behavior of young people.

SOC 447. *Leadership.* ★3 Group interaction and the differentiation of leaders; various social systems. Prerequisite: SOC 341 or 361 or PSYCO 341.

SOC 450. *Techniques of Demographic Analysis.* ★3 Conventional techniques of population analysis as applied to census and vital statistics. Prerequisite: SOC 351.

SOC 472. *Canadian Society.* ★3 The composition of the Canadian population; the value hierarchy, the nature and relationships of the major institutions, and the structure of Canadian society. Prerequisite: SOC 202 or 403.

SOC 544. *Seminar in Socialization Processes.* ★3

SOC 575. *Seminar in Aging and Age Differentiation.* ★3

272.88 Soil Science

SOILS 302. *Principles of Soil Science.* ★3 An introduction to soil components and their properties. Concepts of soil dynamics in different ecological systems. Formation and classification of major soil groups of Canada and the world. A review of world soil resources. Primarily designed for students in faculties other than Agriculture and Forestry.

272.89 Speech Pathology and Audiology

Faculty of Rehabilitation
Medicine

SPA 280. *Introduction to Normal Human Communication.* ★3 Introduction to the development of normal speech language and a survey of classical and contemporary principles and processes in verbal communications.

SPA 281. *Survey of Speech Pathology and Audiology.* ★3 An introduction to the disorders of human communication and the roles of the speech pathologist and audiologist.

SPA 487. *Special Topics in Speech Pathology—Articulation Disorders and Management.* ★3 The course will deal with advanced concepts in techniques of evaluating and describing articulatory disorders with a strong additional emphasis on relationship of measurement techniques to development of management models.

272.90 Spanish-Hispanic Lanuages and Literatures

Department of Romance Languages

SPAN 100. *Beginners' Spanish.* ★6 Spanish grammar and pronunciation; an introduction to Spanish and Hispano-American civilization.

SPAN 300. *Second Year Spanish.* ★6 Intensive grammar, composition, and conversation; an introduction to the reading of Spanish literature. Prerequisite: SPAN 100 or equivalent.

272.91 Statistics

Department of Mathematics

STAT 241. *Introduction to Statistics.* ★3 Random variables and frequency distributions. Averages and variance. The binominal and normal distribution. Sampling distributions and elementary inference. The X^2-test for contingency tables. Regression and correlation. Analysis of variance. Prerequisite: MATH 30 or consent of the Department. This course may not be taken for credit if credit has already been obtained in any of STAT 255, 335, 336, 337, 365.

STAT 255. *Elementary Statistics.* ★6 Graphs, tables, diagrams. Frequency distributions, averages, dispersion, moments. Elementary probability. Binomial, normal and Poisson distributions. Sampling. Regression and correlation. Significance tests. Applications to data in various fields. Prerequisite: MATH 30 or equivalent. This course may not be taken for credit if credit has already been obtained in any of STAT 241, 335, 336, 337, 365.

STAT 336. *Introduction to Statistics.* ★3 Frequency distributions, measures of central tendency and dispersion, sampling distributions, inference on means and proportions, analysis of variance, regression and correlation, contingency tables. Difficulties in applying these techni-

See colored pages for times and sessions when courses are offered.

ques will be illustrated by examples chosen subject to the students' backgrounds. Prerequisite: MATH 30 or consent of the Department. This course may not be taken for credit if credit has already been obtained in any of STAT 241, 255, 335, 337, 365.

272.92 Ukrainian

Department of Slavic Languages

UKR 100. *Beginners' Ukrainian.* ★6 Essentials of grammar, reading and drill on useful expressions. Designed to give a working knowledge of the Ukrainian language. Note: Not open to students with credit in Ukrainian 30.

UKR 106. *Intensive Beginners' Ukrainian I.* ★3 An 'immersion' course designed to give a working knowledge of Ukrainian, with emphasis on conversational skills. Note: This course is given during the Summer Session only.

UKR 107. *Intensive Beginners' Ukrainian II.* ★3 The continuation of UKR 106. Prerequisite: UKR 106 or consent of the Department. Note: This is a Summer Session course given in the Soviet Union.

UKR 200. *First Year University Ukrainian.* ★6 A brief review of phonology, an intensive study of grammar. Readings of selected texts from modern Ukrainian literature, and elementary composition supplemented by laboratory work in conversational Ukrainian. Designed for students having some previous knowledge of Ukrainian. Prerequisite: UKR 30 or the consent of the Department.

272.93 Zoology

ZOOL 325. *Comparative Anatomy of the Vertebrates.* ★3 Comparative anatomy of the vertebrates with special emphasis on the mammals. Prerequisites: two of BIOL 296, 297, 298 or 299, or BIOL 130 and one of BIOL 296, 297, 298 or 299 taken as a corequisite, or consent of the Department.

ZOOL 341. *Vertebrate Physiology.* ★3 Functional biology at the organ system level. Prerequisites: BIOL 299 or 301 and one of BIOL 296, 297, or 298, or consent of the Department.

ZOOL 452. *Principles of Parasitism.* ★3 Host and parasite adaptations; relationships with other forms of symbiosis; effects on host and parasite; parasitism and disease. Prerequisites: BIOL 298; ZOOL 350 or 352/353. Note: ZOOL 352 may be taken as a corequisite with consent of the Department.

273 SPRING SESSION FOR SENIOR CITIZENS

In 1981 The University of Alberta will continue the Spring Session for Senior Citizens. It is a joint venture of the Faculty of Extension and the Special Sessions Office and is supported by a grant from the Department of Advanced Education and Manpower of the Government of Alberta. The session provides Senior Citizens in Alberta a unique opportunity to participate in special interest courses as well as regular University credit courses. An Advisory Committee of Senior Citizens is being consulted on all aspects of the session.

Who may participate?

The session will be open to all residents of Alberta 65 years of age or over and to their spouses who may not yet be 65. Priority will be given to senior citizens who reside north of Red Deer.

What will the session consist of?

Non-Credit Courses: Special interest courses will be offered in such areas as Contempory Canadian Issues, Drawing, Painting, Photography, Fitness, Literature, Creative Writing and many others. The session will commence Monday, May 4, 1981 and will operate during the three weeks following that date. These courses are open to everyone regardless of academic background.

Costs: A nominal registration fee will be charged at the time of registration. Out of town residents will be provided with subsidized accommodation in Lister Hall.

Further Information:

Additional information and a descriptive brochure may be obtained by telephoning 432-3033 or by writing the Dean, Faculty of Extension, 228 Corbett Hall, The University of Alberta, Edmonton, Alberta.

Note: Students registered for Spring Session for Senior Citizens may also wish to take degree credit courses while on campus. The credit courses being offered during the Spring Session 1981 are listed on the green pages of this Calendar. Those persons wishing to take courses for credit must process the normal qualifications for University entrance. Individuals wishing to audit courses can register as auditors outlined in § 261.5.3 of this Calendar.

The University of Alberta grants remission of fees to eligible students age 65 and over. Applications for Remission forms are available from the Fees Division, Comptroller's Office, University of Alberta.

See colored pages for times and sessions when courses are offered.

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The University of Alberta
Spring Session 1981
Schedule of Courses and Timetable

Compiled November 1980

The following Schedule of Courses and Timetable is planned for Spring Session 1981. Information concerning the Scheduling of Courses for Summer Session 1981 is printed on yellow stock in the calendar. Students should ensure that their registration applies to the correct Session.

Spring Session 1981 commences May 4 and ends June 12.

Full Session —May 5 - June 13
1st Term —May 4 - May 22, with classes held on Saturday May 9 in lieu of the Victoria Holiday (May 18).
2nd Term —May 25 - June 12

Courses of weight 3 may be offered over the Full Session (May 4 to June 12) for one 65 minute period per day, or may be offered for two 65 minute periods per day in either the First or Second Term.

Courses of weight 6 are offered for two 65 minute periods per day over the Full Session. Special circumstances are explained in footnotes.

ADMISSION. Admission is separate and distinct from Registration. A student who has *NEVER* attended The University of Alberta *MUST* apply for admission in addition to completing a Spring Session Registration Form. A $12.00 application fee must accompany the application form and it is to be returned to the Office of the Registrar along with complete and official transcripts of academic records. The deadline for Spring Session is *March 2*.

REGISTRATION PROCEDURE. Each student must complete a Spring Session Registration form. This form must be returned to the students' Faculty office by the deadline of *April 1*.

Except when otherwise specified, students will be assigned to courses and sections in the order in which their approved registrations are received by the Office of the Registrar. As enrollment in some courses or sections of courses may be limited, students should apply as early as possible in order to secure their preferences. Courses may be withdrawn for such reasons as insufficient enrollment or staffing difficulties.

CHANGE OF REGISTRATION. If a student wishes to withdraw from a course or change from one course to another, he must complete a "Change of Registration" form and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees. The deadline for Change of Registration is *April 1*.

PRE-SESSION STUDY. Courses which require pre-session study are marked with a dagger (†). Students who register in these courses will receive information on pre-session study with confirmation of registration. Courses not marked with a dagger (†) do not require pre-session study.

WITHDRAWAL. If a student wishes to withdraw from the University, he must complete a "Withdrawal" from and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees.

TEXTBOOKS. The University maintains a large modern Bookstore in the Students' Union Building, where prescribed textbooks and supplies of all kinds may be purchased. The Bookstore also stocks a wide range of books and other items of special interest to students and faculty.

Classrooms and the name of the instructor assigned to the course or section are indicated but are subject to change. If the instructor has been named and has prescribed textbook(s), if any, this information will be available at the University Bookstore. For courses where this information is not available, enquiries should be directed to the Department.

Should book returns be required, the returns policy for the Bookstore is seven days from the date of purchase and returned items must be accompanied by a sales receipt or C.O.D. receipt. Further returns of books resulting from withdrawal or transfer may be made providing that the books are in an unmarked condition and the student requesting the refund has retained his sales receipt or C.O.D. receipt and in addition has obtained a copy of the withdrawal or change of registration form. The request for return must be made within seven days.

FEES. 261.8 of the Special Sessions Calendar carries a complete listing of instructional and other fees.

The names and locations of buildings used are provided on a map appearing at the back of this Calendar. The following abbreviations are used.

A	Arts Building
AG	Agriculture Building
AH	Assiniboia Hall
BS B	Biological Sciences, Botany Wing
BS C	Biological Sciences, Centre Wing
BS G	Biological Sciences, Genetics Wing
BS M	Biological Sciences, Microbiology Wing
BS P	Biological Sciences, Psychology Wing
BS Z	Biological Sciences, Zoology
C E	Chemistry, East Wing
C W	Chemistry, West Wing
CA	Central Academic Building
CH	Corbett Hall
CJ	Faculte Saint-Jean
CS	Clinical Sciences Building
CT	Campus Towers
DP	Dentistry-Pharmacy
EB	Civil and Electrical Engineering
EDN	Education Building, North Wing
ED	Education Building
EM	Mechanical Engineering
FA	Fine Arts
GS	General Services Building
HE	Home Economics Building
HC	Humanities Centre
LC	Law Centre
MS	Medical Sciences
NPP	North Power Plant
P	Physics Building
PE E	Physical Education, East Wing
PE W	Physical Education, West Wing
PS	Printing Services
RL	Rutherford Library
RS	Rutherford South
SJ	St. Joseph's College
SUB	Students' Union Building
T	Henry Marshall Tory Building
TA	Temporary Laboratory "A"
V	V Lecture Wing of Physics-Chemistry
WI	Art Workshop I

The following time conversion table is provided for your assistance:

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
AM 1 PM	AM 2 PM	AM 3 PM	AM 4 PM	AM 5 PM	AM 6 PM	AM 7 PM	AM 8 PM	AM 9 PM	AM 10 PM	AM 11 PM	noon 12 midnight
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400

Final Examination Schedule

Classes Meeting at		Final Examination Conducted	
Time	*Term*	*Day Date*	*Time*
0730 - 0950	1st Term	Friday, May 22	0730 - 0930
1000 - 1220	1st Term	Friday, May 22	1000 - 1200
1330 - 1550	1st Term	Friday, May 22	1330 - 1530
0730 - 0950	Full Term	Friday, June 12	0900 - 1200
1000 - 1220	Full Term	Friday, June 12	1400 - 1700
1330 - 1550	Full Term	Friday, June 12	1900 - 2200
0730 - 0950	2nd Term	Friday, June 12	0730 - 0930
1000 - 1220	2nd Term	Friday, June 12	1400 - 1600
1330 - 1550	2nd Term	Friday, June 12	1900 - 2100
0730 - 0835	Full Term	Friday, June 12	0730 - 0930
0845 - 0950	Full Term	Friday, June 12	1000 - 1200
1000 - 1105	Full Term	Friday, June 12	1330 - 1530
1115 - 1220	Full Term	Friday, June 12	1600 - 1800
1330 - 1435	Full Term	Friday, June 12	1900 - 2100
1445 - 1550	Full Term	Friday, June 12	2130 - 2330

NOTE: Lectures in full-session courses will continue on Friday, May 22 and lectures in First Term and full-session courses will be held on Saturday, May 9 in lieu of the May 18 Statutory Holiday.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ACCTG 202	★3	Lec 30	Full	1000-1105	CA 235	TBA
Introductory Accounting		Lab 30	Full	1330-1435	CA 235	
ACCTG 302	★3	Lec 30	Full	1000-1105	CA 365	TBA
Intermediate Financial Accounting		Lab 30	Full	1115-1305	CA 235	
ACCTG 304	★3	Lec 30	Full	0845-0950	CA 365	TBA
Accounting Information Systems						
ACCTG 404	★3	Lec 30	Full	1000-1105	CA 265	TBA
Intermediate Managerial Control Concepts		Lec 31	Full	1115-1220	CA 369	TBA
ACCTG 453[1]	★3	Lec 40	See Note	1830-2120MW	CA 365	TBA
Managerial Control Systems						
AG EC 433	★3	Lec 10	1st	0730-0950	GS 559	L. Bauer
Advanced Farm and Ranch Management						
AN SC 380	★3	Lec 10	1st	1000-1220	GS 553	M.A. Price
Livestock Growth and Meat Production						
AN SC 460	★3	Lec 20	2nd	0730-0950	GS 553	W.C. Sauer
Fundamentals of Nutrition						
ANTHR 250	★3	Lec 20	2nd	0730-0950	T 1-90	J. Hall
Race and Racism in the Modern World						
ANTHR 306	★3	Lec 20	2nd	1000-1220	TB 5	O. Beattie
Introduction to Prehistory						
ANTHR 307	★3	Lec 10	1st	0730-0950	TB 65	H.T. Lewis
Introduction to Social and Cultural Anthropology		Lec 20	2nd	1000-1220	TB 65	T. Ferguson
ANTHR 309	★3	Lec 10	1st	1000-1220	T 1-113	O. Beattie
Introduction to Physical Anthropology						

1. Classes will meet on Mondays and Wednesdays for 7 weeks, May 4-June 17. Open to graduate students only or by consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ANTHR 325 *Anthropology and World Problems*	★6	Lec 30	Full	0730-0950	T 1-113	D. Bai
ANTHR 330 *Technology in Culture*	★3	Lec 20	2nd	0730-0950	T 1-108	H.T. Lewis
ANTHR 355 *Contemporary Canadian Native Peoples*	★3	Lec 10	1st	1000-1220	TB 121	J. Hall
ANTHR 396 *Archaeological Field Training*	★6	Lec 30	Full	All Day	Strathcona Science Park	TBA
ANTHR 590[1a] *Advanced Physical Anthropology: Methods in the Study of Primate Behavior*	★6	Sem 45	May 4- June 6	See Note	Dilley, Texas	L. Fedigan
		Lab 45	May 4- June 6	See Note	Dilley, Texas	
ART H 303 *Art in the 17th Century*	★3	Lec 10	1st	1000-1220	FAB 220	TBA
ART H 353 *Art in the 18th Century*	★3	Lec 20	2nd	1000-1220	FAB 220	TBA
ART 231[2] *Visual Fundamentals*	★6	Lcl 30	Full	0800-1250	A 334	TBA
		Lcl 31	Full	0800-1250	A 335	TBA
ART 322[3] *Printmaking*	★6	Lcl 30	Full	0800-1250	FAB 240	TBA
ART 339[4] *Special Projects in Studio Disciplines: Drawing*	★6	Lcl 30	Full	0800-1250	A 312	TBA
ART 339[5] *Special Projects in Studio Disciplines: Photography*	★6	Lcl 31	Full	0800-1250	FAB 224	TBA
ART 339[6] *Special Projects in Studio Disciplines: Design Awareness*	★6	Lcl 45	Full	0800-1250	England and West Germany	N. Ohtani
ART 362[7] *Sculpture*	★6	Lcl 30	Full	0800-1250	FAB 110	N. Fiertel
ART 422[3] *Printmaking*	★6	Lcl 30	Full	0800-1250	FAB 240	TBA
ART 439[5] *Special Projects in Studio Disciplines: Photography*	★6	Lcl 31	Full	0800-1250	FAB 224	TBA
ART 439[6] *Special Projects in Studio Disciplines: Design Awareness*	★6	Lcl 45	Full	0800-1250	England and West Germany	N. Ohtani
ART 462[7] *Sculpture*	★6	Lcl 30	Full	0800-1250	FAB 110	N. Fiertel
ART 522[3] *Printmaking*	★6	Lcl 30	Full	0800-1250	FAB 240	TBA
ART 539[5] *Special Projects in Studio Disciplines: Photography*	★6	Lcl 31	Full	0800-1250	FAB 224	TBA

1a. Restricted enrollment course. Departmental consent required before provisional registration will be approved. This course will be withdrawn unless there is a minimum of 10 students enrolled as of April 10, 1981. Classes will commence May 4 with several days on-campus classroom instruction and discussion. The class will than move to the field.

2. Students enrolling in this course may not register in another course during the Spring Session.

3. ART 322-30, ART 422-30, and ART 522-30 will be taught in conjunction. Students enrolling in this course may not register in another course during Spring Session. Departmental consent required.

4. Students enrolling in this course may not register in another course during Spring Session. Departmental consent required. Priority will be given to non-B.F.A. students.

5. ART 339-31, ART 439-31, and ART 539-31 will be taught in conjunction. Students enrolling in this course may not register in another course during Spring Session. Departmental consent required.

6. ART 339-45, ART 439-45, and ART 539-45 will be taught in conjunction. These are restricted enrollment courses and Departmental consent is required before provisional registration will be approved. The courses will be withdrawn unless there is a minimum of 15 students enrolled as of April 1, 1981.

7. ART 362-30, ART 462-30, and ART 562-30 will be taught in conjunction. Students enrolling in this course may not register in another course during Spring Session. Departmental consent required. Emphasis on ceramic media.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ART 539[6] *Special Projects in Studio Disciplines: Design Awareness*	★6	Lcl 45	Full	0800-1250	England and West Germany	N. Ohtani
ART 562[7] *Sculpture*	★6	Lcl 30	Full	0800-1250	FAB 110	N. Fiertel
BACT 530[8] *Biological Techniques in Electron Microscopy*	★3	Lec 10	1st	0845-0950	MS 1-63	R.L.S. Whitehouse
		Lab 10	1st	1000-1600	MS 1-63	
BACT 531[8] *Advanced Biological Techniques in Electron Microscopy*	★3	Lec 20	2nd	0845-0950	MS 1-63	R.L.S. Whitehouse
		Lab 20	2nd	1000-1600	MS 1-63	
BIOL 296 *Evolutionary Biology*	★3	Lec 10	1st	1000-1220	BS B-105	R. Dubin
		Lab 10	1st	1330-1655		
BIOL 299[9] *Biological Function*	★3	Lec 20	2nd	1000-1220	BS B-105	A. Kyle
		Lab 20	2nd	1330-1655		
BUS 365 *Administration of the Small Business*	★3	Lec 30	Full	0845-0950	CA 343	TBA
BUS 401 *Theory of Policy Making*	★3	Lec 30	Full	1115-1220	CA 357	TBA
BUS 556[10] *Business Policy II*	★3	Lec 30	Full	1730-2030MR	CA 229	TBA
CHR T 352 *Medical-Moral Problems*	★3	Lec 20	2nd	1000-1220	SJ 102	L. Walsh
CHR T 380 *Cathechetics I*	★3	Lec 10	1st	1000-1220	SJ 102	D. McLeod
CHR T 411 *Seminar in Ecumenism*	★3	Lec 20	2nd	0730-0950	SJ 102	R. Barringer
CLASS 230 *Introduction to the Ancient Near East and Greece*	★3	Lec 10	1st	0730-0950	HC 1-7	D. Fishwick
CLASS 231 *Introduction to Rome and the West*	★3	Lec 20	2nd	0730-0950	HC 1-7	D. Fishwick
CL TX 417 *Selected Topics: Peruvian Textile Techniques*	★3	Lec 10	1st	1000-1220	HE B-16	M. Frame
		Lab 10	1st	1330-1655	HE 112	
CL TX 417[11] *Selected Topics: Fashion Study Tour*	★3	Lec 45	2nd	All Day	Montreal & Toronto	E. Douglas
		Lab 45	2nd	All Day		
CMPUT 314 *Foundations of Computing Science*	★3	Lec 10	1st	1000-1220	GS 811	S. Dasgupta
		Lab 10	1st	1330-1655	GS 811	
CMPUT 351 *Elements of Programming I*	★3	Lec 10	1st	1000-1220	GS 611	J. Demco
		Lab 10	1st	1330-1655	GS 327	
CMPUT 352 *Elements of Programming II*	★3	Lec 20	2nd	1000-1220	GS 611	K. Brathwaite
		Lab 20	2nd	1330-1655	GS 327	
DANCE 375 *Social Dance*	★3	Lec 10	1st	1330-1550	PE E-19	TBA
DANCE 321[12, 12a] *The Creative Process of Drama*	★3	Lbl 10	1st	See Note	FA 2-43	B. Way
DRAMA 400 *Modern Theatre*	★6	Lec 30	Full	1630-1850	FA 2-47	A. Hawkins

8. Written consent of the Department of Medical Bacteriology required.

9. Laboratories in Biology 299-20 will normally be taught two days a week but not necessarily on the same two days.

10. Open to graduate students only or by consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

11. Restricted enrollment course. Department consent required before provisional registration will be approved. This course will be withdrawn unless there is a minimum of 20 students enrolled as of March 1, 1981.

12. Consent of the Department of Drama required.

12a. Classes in DRAMA 321-10 are scheduled for three weekends in May. The schedule is as follows: May 2 (0900-1700), May 3 (0900-1630), May 9 (0900-1700), May 10 (0900-1630), May 23 (0900-1700) and May 24 (0900-1230).

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
DRAMA 507[12]	★3	Lbl 10	1st	1630-2030	FA 2-43	B. Way
Senior Projects		Lbl 11	1st	0900-1315	FA 1-51	K. Burns
ECON 201	★3	Lec 10	1st	1000-1220	TB 29	S. Sharir
Introduction to Micro-Economics						
ECON 202	★3	Lec 20	2nd	1000-1220	TB 60	S. Sharir
Introduction to Macro-Economics						
ECON 323	★3	Lec 10	1st	1330-1550	TB 57	B. Wilkinson
International Economics						
ECON 341	★3	Lec 10	1st	1000-1220	TB 38	B.L. Scarfe
Money and Finance						
ECON 353	★3	Lec 20	2nd	1000-1220	TB 29	V. Salyzyn
Taxation Policy and Structure						
ECON 363	★3	Lec 20	2nd	1330-1550	TB 29	R. Plain
Introduction to Regional Economics						
ECON 381	★3	Lec 10	1st	0730-0950	TB 108	K. Gupta
Micro-Economic Analysis I						
ECON 382	★3	Lec 20	2nd	0730-0950	TB 5	S. Lewis
Macro-Economic Analysis II						
ED ADM 401	★3	Lec 10	1st	0730-0950	EDN 7-102	TBA
The Role of the Teacher						
ED ADM 463	★3	Lec 20	2nd	0730-0950	EDN 7-102	TBA
The Role of the Administrator and the Supervisor						
ED ADM 465	★3	Lec 10	1st	1330-1550	EDN 7-102	TBA
Organization and Administration of Instruction in the School						
ED ADM 465[13]	★3	Lec 30	April 13-May 22	1800-2100MW	END 7-102	TBA
Organization and Administration of Instruction in the School						
ED ADM 505	★3	Lec 20	2nd	1000-1220	EDN 7-114	TBA
Selected Topics in Educational Administration: Skills and Knowledge for School-Community Relations						
ED ADM 506	★3	Lec 10	1st	0730-0950	EDN 7-140	TBA
Selected Topics in Educational Administration II: Computing Concepts in Educational Administration						
ED ADM 511[14]	★3	Lec 10	1st	1000-1220	EDN 7-140	TBA
Research Design and Data Analysis I						
ED ADM 512[14]	★3	Lec 20	2nd	1000-1220	EDN 7-140	TBA
Research Design and Data Analysis II						
ED ADM 515	★3	Lec 10	1st	0730-0950	EDN 7-114	TBA
Research Projects I: Administration of Program Evaluation						
ED ADM 516	★3	Lec 20	2nd	0730-0950	EDN 7-114	TBA
Research Projects II: Practicum: Administration of Program Evaluation						
ED ADM 528	★3	Lec 20	2nd	0730-0950	EDN 7-140	TBA
Administration of Student Personnel Services						

13. Priority in registration will be given to school teachers. Approval of the Department of Educational Administration is required. Deadline for submission of registration is March 13. The course runs six weeks commencing April 13.

14. Students who enroll in ED ADM 511 must also enroll in ED ADM 512.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED ADM 532 *Organization of School Districts*	★3	Lec 10	1st	1000-1220	EDN 7-114	TBA
ED ADM 571 *The Organization of Postsecondary Education*	★3	Lec 40	June 15-26	0800-1200	Alberta Vocational Centre-Edmonton	TBA
ED ADM 593 *Seminar and Practicum in Administrative Behavior I*	★3	Lec 20	2nd	1330-1550	EDN 7-102	TBA
ED ADM 594 *Seminar and Practicum in Administrative Behavior II*	★3	Lec 10	1st	1330-1550	EDN 7-114	TBA
ED ADU 439 *Methods and Programs in the Teaching of English as a Second Language to Adults*	★3	Lec 20	2nd	1330-1550	ED 213	TBA
ED ADU 521 *Psychology of Learning and Teaching at the Adult Level*	★3	Lec 30	Full	1700-1950MW	EDN 1-112	TBA
ED AV 361 *Audiovisual Communications*	★3	Lec 10 Lec 11	1st 1st	1000-1220 1000-1220	EDN B-131B EDN B-131A	E. Rankin K. Bowers
ED AV 363 *Preparation of Instructional Materials*	★3	Lec 20 Lab 20 Lec 21 Lab 21	2nd 2nd 2nd 2nd	1000-1220 TBA 1000-1220 TBA	EDN B-131B EDN B-131B EDN B-131A EDN B-131A	C.Y. Oh D. Engel
ED CI 216[15] *Curriculum and Instruction in Elementary School Mathematics*	★3	Lec 10	1st	1000-1220	ED 934-934a	D. Sawada
ED CI 229[15] *Curriculum and Instruction in Elementary School Language*	★3	Lcl 20	2nd	1330-1550	ED 327	D. Dillon
MOV 231[15] *Curriculum and Instruction in Games K-VI*	★3	Lcl 10	1st	1000-1220	Ed Gym	TBA
ED CI 308[15,16] *Introduction to Second Language Teaching in the Elementary School*	★3	Lec 10	1st	1330-1550	ED 218	D. Parker
ED CI 317[15] *Diagnostic Teaching of Mathematics*	★3	Lec 20	2nd	0730-0950	ED 934-934a	G. Cathcart
ED CI 323[15] *Introduction to Elementary School Reading Instruction*	★3	Lec 10	1st	0730-0950	ED 276	L. Phillip-Riggs
ED CI 326[15] *Diagnostic Teaching of Reading*	★3	Lec 10 Lab 10	1st 1st	1330-1550 1550-1655	ED 228 ED 228	W. Wilde
ED CI 329[15] *Elementary School Language*	★3	Lec 10	1st	1000-1220	ED 327	M. Mallet
ED CI 332[15] *Speech Problems: Role of the Classroom Teacher*	★3	Lec 30	Full	1330-1620TR	ED 277	H. Ilott
ED CI 356[15,16] *Curriculum and Instruction in Secondary School Second Language I*	★3	Lec 10	1st	1330-1550	ED 218	D. Parker
ED CI 404[17] *Curriculum and Instruction in Early Childhood Education*	★6	Lec 30 Lab 30	Full Full	1300-1550 0830-1230	ED 201/203 Child Centre	M.A. Power

15. Not open to students on *Elem. Ed. Generalist* (AD certificate, Transfer or 4-Year B.Ed.) *Programs*. Those students completing Plan A or Plan B Programs must leave program slots open for Professional Term including Phase III Practicum.

16. Classes in ED CI 308-10 and ED CI 356-10 will be taught in conjunction.

17. First priority for registration will be given to students who require ED CI 404 to graduate in fall of 1981. Second priority will be given to students who require ED CI 404 to complete their program by December 1981. Third priority will be given to students on a diploma program after graduation. All students must have completed their first three years, i.e. 90 credits and their practicum before taking ED CI 404.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED CI 408[15, 18] *Methods and Programs in the Teaching of Second Languages in the Elementary School*	★3	Lec 30	Full	1900-2150MW	ED 218	D. Parker
ED CI 424[15] *Reading in Early Childhood Education*	★3	Lec 20	2nd	0730-0950	ED 221	D. Dillon
ED CI 430[15] *Creative Aspects of Language in the Elementary School*	★3	Lec 20	2nd	1330-1550	ED 315	D. Searle
ED CI 445[18a] *Seminar in Group Projects in Elementary II: Teaching Speech in the Elementary School*	★3	Lec 10	1st	1800-2100MTWR	ED 551a	J. McIntyre
ED CI 445 *Seminar in Group Projects in Elementary Education II: Teaching Art in the Elementary School*	★3	Lec 30	Full	1900-2130MW	ED 436	B. Schwartz
ED CI 462 *Innovations in Secondary School Social Studies Curriculum*	★3	Lec 10	1st	1800-2155MWR	ED 255	J. Parsons
ED CI 463 *New Approaches in Secondary School Social Studies Instruction*	★3	Lec 20	2nd	1800-2155MWR	ED 255	J. Parsons
ED CI 497 *Conference Seminar: Curriculum and Instruction in Religious and Moral Education*	★3	Lec 10	1st	1000-1220	ED 265	W. Hrychuk
ED CI 497 *Conference Seminar: Curriculum Issues in Secondary School Physical Education*	★3	Lec 30	Full	1830-2115MW	ED 265	L. Beauchamp
ED CI 498 *Conference Seminar: Individualizing Curriculum and Instruction in Secondary School Physical Education*	★3	Lec 30	Full	1830-2115TR	ED 265	L. Beauchamp
ED CI 529[19] *Language Acquisition and Growth in Young School Children*	★3	Lec 30	Full	1830-2120MW	ED 301	D. Searle
ED CI 549[20] *Curriculum Development*	★3	Lec 10	1st	0900-1120	ED 382	K. Jacknicke
ED CI 550[20] *Current Curriculum Developments*	★3	Lec 20	2nd	0900-1120	ED 382	K. Jacknicke
ED CI 649[21] *Curriculum Evaluation*	★3	Lec 10	1st	0900-1120	ED 282	T. Aoki and D. Massey
ED CI 650[21] *Curriculum Evaluation Practicum*	★3	Lec 20	2nd	0900-1120	ED 282	T. Aoki and D. Massey

18. The course will examine the problems involved in (1) multilingual, multicultural teaching and offer solutions to these; (2) may be taken concurrently with ED CI 308.

18a. Open to practicing teachers. Assignment will be to work with a class of children.

19. Consent of the Department required. See: E.J. Graham, Room ED 533, phone 432-4273.

20. Students who register in ED CI 549 and ED CI 550 may not register in another course in Spring Session. ED CI 549 is the prerequisite for ED CI 550. Permission of the Department is required. Priority will be given to registrants in both ED CI 549 and ED CI 550.

21. Students who register in ED CI 649 and ED CI 650 may not register in another course in Spring Session. ED CI 649 is the prerequisite for ED CI 650.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED FDN 401 *Selected Topics in Educational Foundations: Multiculturalism in the Canadian Mosaic*	★3	Lec 10	1st	1630-1850	ED 113	H. Garfinkle
ED FDN 420 *Contemporary Systems of Education in Western Europe, the U.S.A. and the U.S.S.R.*	★3	Lec 10	1st	1000-1220	ED 113	D. Pugh
ED FDN 422 *Education in Developing Countries: A Study of Education in Selected Areas in Asia, Africa and Latin America*	★3	Lec 10	1st	1330-1550	ED 113	R. Pannu
ED FDN 430 *History of Education in Western Canada*	★3	Lec 20	2nd	0730-0950	ED 277	B. Titley
ED FDN 431 *The Education of Selected Minority Groups in Western Canada: An Historical Study*	★3	Lec 10	1st	1330-1550	ED 128	N. Kach
ED FDN 432 *The Education of Native Peoples in Canada: An Historical Study*	★3	Lec 20	2nd	1000-1220	EDN 2-135	R. Carney
ED FDN 441 *History of Educational Thought in Modern Times*	★3	Lec 20	2nd	0730-0950	ED 113	M. Bauer
ED FDN 452 *Education and Theories of Knowledge: A Philosophical Approach*	★3	Lec 20	2nd	1000-1220	ED 113	F. Walker
ED FDN 453 *Logic in Teaching*	★3	Lec 10	1st	1330-1550	ED 213	S. Carson
ED FDN 470 *Issues in Contemporary Education*	★3	Lec 10 Lec 20	1st 2nd	0730-0950 1330-1550	ED 106 ED 107	D. Wangler D. Wangler
ED FDN 522 *Functions of Education in the Development of Emerging Nations*	★3	Lec 20	2nd	1330-1550	ED 113	R. Pannu
ED FDN 540 *History of Modern Education*	★3	Lec 10	1st	1330-1550	ED 221	P. Miller
ED IND 223 *Practicum I*	★0	Cln 30	Full	TBA	TBA	TBA
ED IND 323 *Practicum II*	★0	Cln 30	Full	TBA	TBA	TBA
ED IND 343 *Practicum III*	★0	Cln 30	Full	TBA	TBA	TBA
ED IND 385[22] *Methods of Performance Evaluation in Vocational Education*	★3	Lec 20	2nd	1700-1950	EDN 1-107	TBA
ED IND 423 *Practicum IV*	★0	Cln 30	Full	TBA	TBA	TBA
ED IND 465 *Manpower and Curriculum Implications*	★3	Lec 20	2nd	1000-1220	EDN 2-101	TBA
ED IND 490 *Writing of Learning/Training Objectives*	★3	Lec 10	1st	1700-1950	EDN 2-135	TBA
ED PR 200[23] *Student Teaching: Elementary*	★6	Lab 30	Full	All Day		TBA
ED PR 201[23] *Student Teaching: Elementary*	★3	Lab 10	1st	All Day		TBA

22. Open to students on the Post-Secondary (Plan "J") Program only.

23. Consent of Field Services required.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED PR 251[23]	★3	Lec 10	1st	1330-1435	TBA	TBA
A Study of Classroom Behavior		Lab 10	1st	0800-1200		
ED PR 301[24]	★3	Lab 10	1st	All Day		TBA
Student Teaching: Elementary		Lab 20	2nd	All Day		TBA
ED PR 351[23]	★3	Lab 10	1st	All Day		TBA
Student Teaching						
ED PR 353[23]	★3	Lab 10	1st	All Day		TBA
Student Teaching						
ED PR 355[25]	★3	Lab 10	1st	All Day		TBA
Student Teaching in the Secondary School						
ED PR 356[25]	★3	Lab 10	1st	All Day		TBA
Student Teaching in the Secondary School						
ED PR 402[23]	★9	Lab 30	Full	All Day		TBA
Student Teaching: Elementary						
ED PR 454[26]	★3	Lab 10	1st	All Day		TBA
Student Teaching at Post-Secondary Level: I						
ED PR 455[27]	★3	Lab 10	1st	All Day		TBA
Student Teaching at Post-Secondary Level: II		Lab 20	2nd	All Day		TBA
ED PSY 329	★3	Lec 30	Full	0800-0950MWF	EDN 1-126	F. Boersma
Educational Psychology of Adolescence						
ED PSY 341†	★3	Lec 10	1st	1000-1220	EDN 2-145	J. Bishop
Psychology of Exceptional Children and Youth						
ED PSY 351	★3	Lec 30	Full	1000-1105	EDN 1-128	J. Goldberg
Developmental and Learning Characteristics of Exceptional Children						
ED PSY 355	★3	Lec 30	Full	1230-1350	EDN 2-119	J. Goldberg
Psycoeducational Diagnosis and Assessment of Exceptional Children		Lab 30	Full	TBA	TBA	
ED PSY 357	★3	Lec 30	Full	1330-1435	EDN 1-108	J. Chambers
Behavioral and Instructional Management of Exceptional Children		Lab 30	Full	TBA	TBA	
ED PSY 361[28]	★3	Lec 30	Full	0900-1200	ED 380	TBA
Seminar and Clinical Practicum: Exceptional Children		Lab 30	Full	TBA	TBA	
ED PSY 411†	★3	Lec 20	2nd	1000-1220	EDN 2-103	L. Eberlein
Introduction to Guidance						
ED PSY 412[29]	★6	Lec 30	Full	1830-2120W & 0900-1600S	EDN 5-152 and EDN 2-125	P. Calder et al.
The Psychology of Classroom Communication		Lab 30	Full	TBA	TBA	
ED PSY 459	★3	Lec 30	Full	1330-1520TWR	EDN 2-137	C. Norman
Seminar in Special Education						
ED PSY 461[28]	★3	Lec 30	Full	0900-1200	EDN 2-139	C. King
Seminar and Classroom Practicum: Exceptional Children		Lab 30	Full	TBA	TBA	

24. Consent of Field Services required. ED PR 301 may be taken in 2nd term only if required companion course is taken in first term.
25. Consent of Field Services required. Students may not enroll in both ED PR 355 and ED PR 356.
26. Consent of Field Services required. Registration open only to students in Vocational/Industrial Arts routes.
27. Consent of Field Services required. Second term section open only to students who have completed ED PR 454 in first term. Registration open only to students in Vocational/Industrial Arts.
28. Students must be available for the entire morning to participate in field work.
29. Priority in registration for ED PSY 412 will be given to regular elementary and junior high school teachers within the Edmonton area (20 mile radius). Others will be put on a waiting list. Application and consent must be obtained from the Department of Educational Psychology.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED PSY 469 *Human Development and Education*	★3	Lec 30	Full	0845-0950	EDN 2-147	R. Frender
ED PSY 471 *Learning and Instruction*	★3	Lec 30	Full	1115-1220	EDN 2-149	R. Short
ED PSY 475 *Individual Differences in Education*	★3	Lec 30	Full	1000-1105	EDN 2-151	R. Frender
ED PSY 510†[30] *Counselling Theory I*	★6	Lec 30	Full	1830-2120F & 0900-1600S	EDN 1-110	W. Hague et al.
		Lab 30	Full	TBA	TBA	
ED PSY 515 *Theories of Personality*	★3	Lec 30	Full	1700-1950TR	EDN 1-112	J. Mitchell
ED PSY 538[32] *Practicum in Special Education*	★6	Lec 30	Full	Individually Scheduled		M. Bibby
		Lab 30	Full	TBA		
ED PSY 580[33] *Seminar and Research in Educational Measurement*	★6	Lec 30	Full	1600-1830	EDN 1-114	T. Maguire
		Lab 30	Full	TBA	TBA	
ED PSY 591 *Social Psychology and Education*	★3	Lec 30	Full	1700-1830MTWR	ED 277	L. Stewin
ED PSY 597[34] *Special Seminars: Psychological Level Communication*	★3	Lec 30	Full	1700-1950MW	EDN 1-110	P. Koziey
ED PSY 597[34] *Special Seminars: Counselling Women*	★3	Lec 31	Full	1700-1950TR	EDN 1-110	R. Jevne
ED PSY 598[34,35] *Special Seminars: Family Counselling Practicum*	★6	Lec 30	Full	1830-2120F & 0900-1600S	EDN 1-112	D. Sawatzky
		Lab 30	Full	TBA		
ED PSY 598[34] *Special Seminars: Advanced Course in Psycoeducational Assessment*	★6	Lec 31	May 4-June 25	1700-1950MTR	EDN 5-152	L. Whyte
		Lab 31	May 4-June 25	TBA		
ENG G 210 *Engineering Graphics*	★3.5	Lec 10	1st	1030-1200	EB 325	J.J. Bakker
		Lab 10	1st	1300-1625	EB 320	
ENG G 231 *Engineering Statics II*	★3	Lec 10	1st	0800-0930	EB 336	TBA
		Lab 10	1st	1000-1200	EB 205	
ENGL 210† *English Literary Forms*	★6	Lec 30	Full	0730-0950	HC 2-7	J. Lehr
ENGL 275† *Readings in Prose*	★3	Lec 10	1st	0730-0950	HC 1-11	G. Wickens
ENGL 284† *Canadian Literature in Process*	★3	Lec 20	2nd	0730-0950	HC 2-17	J. Taylor
ENGL 305†[36] *The Development of Children's Literature*	★3	Lec 10	1st	1000-1220	HC 2-11	J. Stott
ENGL 306†[36] *Folklore in Children's Literature*	★3	Lec 30	Full	1800-2140TR	HC 1-11	J. Stott

30. Must be taken in conjunction with ED PSY 512 offered in Summer Session 1981. Applications available from the Department of Educational Psychology. Students must make application for both courses prior to Spring Session 1981. There will be a pre-session meeting on Saturday, March 21 and Saturday, April 11 from 0900-1600.
32. Registration limited to students in Special Education Hearing Impaired Program. Departmental consent required.
33. This course is being offered 3 weeks in Spring Session and 3 weeks in Summer Session. Students must consult with the instructor for Summer Session schedule. Professor Maguire's phone number is 432-3763 or 432-3762.
34. All sections of ED PSY 597 and ED PSY 598 require written consent of the Department of Educational Psychology.
35. Students must have ED PSY 510 and ED PSY 512 or equivalent and written consent of the Department of Educational Psychology.
36. Students in the Faculty of Arts may take these courses as an outside of the Faculty free option but not for credit towards an English major or minor.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ENGL 309† *Expository Writing*	★6	Lec 30	Full	1330-1550	HC 1-11	E. Bishop
ENGL 313† *The Modern English Language*	★3	Lec 20	2nd	0730-0950	HC 1-15	W. Schipper
ENGL 331† *The Later English Renaissance*	★3	Lec 20	2nd	1330-1550	HC 1-15	H. Hargreaves
ENGL 335† *English Drama to 1642*	★3	Lec 10	1st	1330-1550	HC 2-17	H. Hargreaves
ENGL 351† *The Later Victorian Age*	★3	Lec 10	1st	1000-1220	HC 1-11	C. Gordon-Craig
ENGL 360† *The Modern American Novel*	★3	Lec 20	2nd	1000-1220	HC 1-11	E. Pitcher
ENGL 369† *The Canadian Literary Tradition: Urban*	★3	Lec 10	1st	1000-1220	HC 2-7	N. Golfman
ENPRO 203 *Enseignement pratique: Niveau élémentaire*	★3	Lab 40	April 20-June 26	All Day		H. Hébert
ENPRO 204 *Enseignement pratique: Niveau élémentaire*	★3	Lab 40	April 20-June 26	All Day		TBA
ENPRO 205 *Enseignement pratique: Niveau élémentaire*	★3	Lab 40	April 20-June 26	All Day		TBA
ENPRO 254 *Enseignement pratique: Niveau secondaire*	★3	Lab 40	April 20-June 26	All Day		F. Levasseur-Ouimet
ENPRO 255 *Enseignement pratique: Niveau secondaire*	★3	Lab 40	April 20-June 26	All Day		TBA
ENPRO 256 *Enseignement pratique: Niveau secondaire*	★3	Lab 40	April 20-June 26	All Day		TBA
FAM 359 *Presentation and Communication*	★3	Lec 30 Lab 30	Full Full	0900-1225MT 0900-1225WR	HE 219	P. Leginsky
FAM 440 *Consumer Problems*	★3	Lec 20	2nd	1000-1220	EDN 1-126	K. Laverty
FAM 445[37] *Practicum in Family Services II*	★6	Lec 30	Full	All Day	TBA	TBA
FAM 448 *Understanding Family Communication*	★3	Lec 30	Full	1830-2130TR	HE 219	J. Montgomery
FAM 449 *Family Study: Meeting the Needs of the Aging Family*	★3	Lec 10	1st	0730-0950	EDN 1-108	N. Keating
FAM 541 *Seminar: Human Sexuality and Sex Education in Family Life Education*	★3	Sem 30	Full	1500-1800MW	HE 219	W. Adams
FD NU 325 *Introductory Nutrition I*	★3	Lec 10 Lab 10	1st 1st	0730-0950 TBA	HE B-19	TBA
FD NU 327 *Introductory Nutrition II*	★3	Lec 20 Lab 20	2nd 2nd	0730-0950 TBA	HE B-19	TBA
FD SC 200 *Introduction to Food Science*	★3	Lec 10	1st	0730-0950	DP 6069	H. Jackson and E. Jackson
FIN 304 *Business Finance*	★3	Lec 30	Full	0845-0950	CA 377	TBA

37. Only open to the senior family studies students who have had a prearranged practicum placement.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
FIN 411 *Investment Principles: Security Analysis*	★3	Lec 30	Full	1000-1105	CA 357	TBA
FREN 100 *Beginners' French*	★6	Lec 30	Full	1000-1220 and 1330-1455	A 11	D. Fearon
		Lab 30	Full	1505-1610	A 11	TBA
		Lec 31	Full	1000-1220 and 1330-1455	A 46	P. Webb
		Lab 31	Full	1505-1610	A 46	TBA
GEOG 230 *Introductory Physical Geography I*	★3	Lec 10	1st	1000-1220	T 3-76	R.B. Rains
		Lab 10	1st	1330-1550	T 3-76	
GEOG 231 *Introductory Physical Geography II*	★3	Lec 20	2nd	1000-1220	T 3-76	I.A. Campbell
		Lab 20	2nd	1330-1550	T 3-76	
GEOG 250 *Spatial Organization of Human Activity*	★3	Lec 10	1st	1330-1550	T 3-58	M.J. Hodgson
GEOG 438[38] *Mountain Geomorphology*	★3	Lec 10	June 1-12	1000-1220	T 3-70	H.J. McPherson
GEOL 301 *Earth Science I*	★3	Lec 10	1st	1000-1220	AG 245	TBA
GEOL 302 *Earth Science II*	★3	Lec 20	2nd	1000-1220	AG 245	TBA
GEOL 305 *Environment Earth*	★3	Lec 10	1st	0730-0950	AG 155	D.W.R. Wilson
GEOL 306 *The Succession of Life Through Geological Time*	★3	Lec 20	2nd	0730-0950	AG 155	D.W.R. Wilson
HE ED 391 *Health Education in Secondary Schools I*	★3	Lec 10	1st	1000-1220	PE W1-39	A. Bauer
HIST 200 *European History*	★6	Lec 30	Full	1000-1220	HC 2-14	M. Katz
HIST 278 *An Introduction to the Study of Canadian History 1500-1867*	★3	Lec 10	1st	1000-1220	TB 57	D. Mills
HIST 279 *An Introduction to the Study of Canadian History 1867-1967*	★3	Lec 20	2nd	1000-1220	TB 57	D. Mills
HIST 280 *Asia to 1500*	★3	Lec 10	1st	1330-1550	TB 104	A. Chan
HIST 360 *American History*	★6	Lec 30	Full	0730-0950	TB 121	D. Dinwoodie
HIST 379 *The Native Aspect of Canadian History*	★3	Lec 10	1st	1000-1220	T 1-100	O.P. Dickason
INT D 393 *Political Sociology*	★3	Lec 20	2nd	0730-0950	T 1-104	J. Kenward
INT D 469 *Plans for Heritage Interpretation*	★3	Lec 10	1st	1330-1550	PE W1-39	W. Barkley
LATIN 100 *Beginners' Latin*	★6	Lec 30	Full	1000-1220	HC 2-21	J.R. Wilson
		Lab 30	Full	1330-1550		
LAW 300[39] *Law for Non-LL.B. Students I*	★3	Lec 10	1st	1000-1220	LC 201	B.P. Elman
		Lec 11	1st	1000-1220	LC 207	J.S. Williams
LAW 301[40] *Law for Non LL.B. Students II*	★3	Lec 20	2nd	1000-1220	LC 201	R.G. Hopp

38. Classes in GEOG 438 will be scheduled June 1-June 12, 1981. The first week of classes will be held on-campus with lectures scheduled from 1000-1220. The second week of classes will be held at the Kananaskis Centre for Environmental Research for the field work portion of the course. Classes at the Centre will be held all day. Students will be expected to cover costs of food and transportation.

39. Not available for credit in the LL.B. Programme.

40. Normally LAW 300 would be a prerequisite, but this requirement can be waived at the discretion of the Instructor. Not available for credit in the LL.B. Programme.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
LEG R 310	★3	Lec 20	2nd	1330-1550	CA 343	I.F. Ivankovich
Commercial Law						
LIB S 412†[41]	★3	Lec 30	Full	1000-1105	RS 3-01	J. Henry
Storytelling						
LIB S 432†[41]	★3	Lec 30	Full	0845-0950	RS 3-01	J. Henry
Survey of Materials for Children						
LIB S 522	★3	Lec 10	1st	TBA	Saskatoon	M.E.P. Henderson
Library Systems and Networks						
LIB S 522	★3	Lec 11	1st	TBA	Winnipeg	R. Inskip
Library Systems and Networks						
LIB S 532	★3	Lec 10	1st	TBA	Calgary	S.E. Wright
Informational Materials for Children and Young Adults						
LING 303[42]	★3	Lec 10	1st	1000-1220	GS 769	B.L. Derwing
Introduction to Linguistics		Sem 10	1st	1330-1550	GS 769	
LING 382	★3	Lec 20	2nd	1000-1220	GS 769	L. Marckworth-Stanford
Modern English Syntax						
MANEC 323	★3	Lec 30	Full	1000-1105	CA 343	TBA
Business Economics						
MANEC 333	★3	Lec 30	Full	1115-1220	CA 343	TBA
Aggregate Income Analysis						
MANEC 411	★3	Lec 30	Full	0845-0950	CA 339	TBA
International Business						
MARK 304	★3	Lec 30	Full	1000-1105	CA 369	TBA
Fundamentals of Marketing						
MARK 458[43]	★3	Lec 40	See Note	1830-2130TR	CA 357	TBA
Marketing Management						
MATH 202	★3	Lec 30	Full	1000-1105	CA 273	TBA
Elementary Calculus I		Lab 30	Full	1105-1135	CA 273	
MATH 213	★5	Lec 10	1st	1000-1150 & 1330-1435	CA 243	TBA
Calculus II		Lab 10	1st	1445-1655	CA 243	
MATH 221	★3	Lec 30	Full	1330-1435	CA 335	TBA
Linear Algebra I						
MATH 240	★3	Lec 30	Full	1000-1130	CA 335	TBA
Algebra and Elementary Calculus I						
MATH 251	★3	Lec 30	Full	1330-1435	CA 273	TBA
Mathematics of Finance I						
MATH 302	★3	Lec 30	Full	1000-1105	CA 281	TBA
Intermediate Calculus I						
MATH 315	★3	Lec 10	1st	1000-1220	CA 339	TBA
Calculus III						
MGTSC 306	★3	Lec 30	Full	0845-0950	CA 369	TBA
Probability and Statistics for Business Part I						
MGTSC 356	★3	Lec 30	Full	0845-0950	CA 357	TBA
Introduction to Management Science (Operations Research)		Lec 31	Full	1000-1105	CA 373	TBA
MOV 202	★3	Lcl 10	1st	1000-1310	Ed Gym and ED G-208	N. Melnychuk
Introduction to the Movement Activities of Children Aged 8-12						
MOV 244	★3	Lcl 10	1st	0730-0950	Ed Gym, ED G-208 and South Field	TBA
Introduction to the Movement Activities of Youth, Part I						
MOV 245	★3	Lcl 20	2nd	0730-0950	Ed Gym, ED G-208 and South Field	M. Head
Introduction to the Movement Activities of Youth, Part II						

41. Consent of the Faculty of Library Science required.

42. Students who register in LING 303 should not register in another course in 1st Term Spring Session.

43. Classes will meet on Tuesdays and Thursdays for 7 weeks, May 5-June 18. Open to graduate students only or by consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
MOV 301 *Motor Development and Motor Learning*	★3	Lec 30	Full	1830-2130	ED 254	TBA
MOV 427 *A Study of Dance for Children*	★3	Lcl 20	2nd	1000-1310	ED Gym, and ED G-208	C. Marshall
MUSIC 200 *Rudiments of Music*	★3	Lec 10	1st	1000-1220	FA 2-34	F. Pier
MUSIC 301 *History of Classical Music*	★3	Lec 20	2nd	1000-1220	FA 2-34	W. Berg
NURS 305[44] *Health Assessment of Adults and Children*	★3	Sem 10	1st	0900-1600	CS 3-101 & MS 2-43	TBA
		Sem 11	1st	0900-1600	CS 3-101 & MS 2-43	TBA
		Sem 12	1st	0900-1600	CS 3-101 & MS 2-43	TBA
		Sem 13	1st	0900-1600	CS 3-101 & MS 2-43	TBA
		Sem 14	1st	0900-1600	CS 3-101 & MS 2-43	TBA
		Sem 15	1st	0900-1600	CS 3-101 & MS 2-43	TBA
NURS 325[44] *Introduction to Nursing of Individuals with Health Deviations*	★3	Sem 10	1st	0700-1600	Agencies	TBA
		Sem 11	1st	0700-1600	Agencies	TBA
		Sem 12	1st	0700-1600	Agencies	TBA
		Sem 13	1st	0700-1600	Agencies	TBA
		Sem 14	1st	0700-1600	Agencies	TBA
		Sem 15	1st	0700-1600	Agencies	TBA
		Sem 16	1st	0700-1600	Agencies	TBA
NURS 464[44] *Nursing of Clients with Health Deviations III*	★6	Sem 10	Full	0700-1600	Hospitals	TBA
		Sem 11	Full	0700-1600	Hospitals	TBA
		Sem 12	Full	0700-1600	Hospitals	TBA
		Sem 13	Full	0700-1600	Hospitals	TBA
		Sem 14	Full	0700-1600	Hospitals	TBA
NURS 485[44] *Senior Nursing Practicum*	★4	Sem 10	1st	0900-1050	CS 3-103	B. Harrington
		Cln 10	1st	1100-1700	Agencies	
OCCTH 207 *History, Systems and Resources of Rehabilitation*	★3	Lec 10	1st	1000-1220	CH 114	E.S.G. Brintnell
OCCTH 208 *Introduction to Occupational Therapy Theory and Practice in Psychiatry*	★3	Lec 10	1st	1330-1550	CH 201	J.W. Vargo
OCCTH 319[45] *Life Span Development*	★3	Lcl 10	1st	1000-1220	CH 218	J. Smith and H. Madill
OCCTH 498 *Special Seminars: Learning Disorders of Children*	★3	Sem 10	1st	1330-1550	CH 114	S. Dennis
ORG A 472[46] *Organization Theory and Administrative Practice*	★3	Lec 40	See Note	1830-2120R	CA 357	TBA
ORG T 303 *Behavior in Organizations*	★3	Lec 30	Full	0845-0950	CA 335	TBA
P ED 204 *Structural Anatomy*	★3	Lec 30	Full	1000-1105	PE E-120	TBA
		Lab 30	Full	1115-1250	PE E-412	
P ED 211 *Introduction to Basketball*	★3	Lec 10	1st	0730-0950	PE W1-39 and PE West Gym	TBA
P ED 215 *Introduction to Soccer*	★3	Lec 20	2nd	1000-1220	PE W1-59, South Field, and PE Main Gym	G. Redmond
P ED 216 *Introduction to Volleyball*	★3	Lec 10	1st	0730-0950	PE W1-39 and PE Main Gym	J. Duperrault

44. Students enrolling in this course may not enroll in another course concurrently.

45. Registration open to Nursing students only.

46. Classes will meet on Thursdays for 13 weeks May 7-July 30. Open to graduate students only or by consent of the Associate Dean (Graduate), Faculty of Business Administration and Commerce.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
P ED 223[47] *Boating*	★3	Lec 40	May 4-30	All Day	PE W1-38	M. Lund
P ED 229 *Introduction to Track and Field II*	★3	Lec 20	2nd	1330-1550	PE W1-39, Football Field, and PE West Gym	G. Simonyi
P ED 231[48] *Court Sports*	★3	Lec 30	Full	0730-0810	PE E-120	E.J. Watkinson
		Lab 30	Full	0815-0950	PE East Courts	
P ED 234[49] *Introductory Golf*	★3	Lec 20	2nd	0730-0950	PE E-436 and Lister Field	P.L. Lindsay
P ED 236[50] *Racquet Sports*	★3	Lec 20	2nd	0730-0950	PE Main Gym and Tennis Courts	G.J. Smith
		Lec 21	2nd	1330-1550	PE Main Gym and Tennis Courts	TBA
P ED 382[47] *Warm Weather Outdoor Education*	★3	Lec 40	May 4-30	All Day	PE W1-38	M. Kochanski and M. Lund
		Lab 40	May 4-30	All Day	Field Work	
HE ED 391 *Health Education in Secondary Schools I*	★3	Lec 10	1st	1000-1220	PE W1-39	A. Bauer
P ED 401 *Sociology of Sport*	★3	Lec 10	1st	1000-1220	PE E-436	M.A. Hall
P ED 499[47] *Directed Studies: Wilderness Arts, Crafts, and Living Skills*	★3	Lec 40	May 4-30	All Day	PE W1-38	M. Kochanski
P ED 655 *Energy Mobilization and Training*	★3	Sem 10	1st	1000-1220	PE E-470	H.A. Quinney
PHIL 230 *Problems of Philosophy*	★3	Lec 10	1st	1000-1220	HC 1-15	M. Richardson
PHIL 239 *Philosophical Analysis of Contemporary Issues*	★3	Lec 20	2nd	1330-1550	HC 1-3	S. DeHaven
PHIL 559 *Topics in Philosophy of the Social Sciences*	★3	Lec 30	Full	TBA	HC 4-78	R.A. Shiner
PHYSL 262 *Elementary Physiology*	★6	Lec 30	Full	0830-1130	MS 2-27	C. Kyriakides
POL S 300 *Comparative Political Systems*	★6	Lec 30	Full	1330-1550	T 11-9	E.P. Murray
POL S 321 *Canadian Government*	★3	Lec 10	1st	1000-1220	T 1-129	A. Tupper
POL S 322 *Local Government and Administration*	★3	Lec 20	2nd	1000-1220	T 1-129	J. Lightbody

47. This course is one of three half-year courses in Outdoor Education (P ED 223 - Boating; P ED 382 - Warm Weather Outdoor Education; P ED 499 - Wilderness Arts, Crafts, and Living Skills) offered over the period of May 4 to May 30, 1981. Students may register in one to three of these courses but are expected to participate in all Spring Camp activities and pay the full camp fee; therefore, students are requested to register in two or three of these half courses. Participation in pre-course reading and a preliminary examination and final examination will be required for each course. Students are required to supply their own sleeping bag and other personal gear, some food, and a camp fee of up to $120.00 will be charged to cover the cost of transportation, food, and other expenses. On May 4th, students will meet on-campus in PE W1-38 at 8:00 a.m. to prepare for the first off-campus session. Students should be prepared for an overnight backpacking trip in the evening of May 4th. During this program, the majority of the time will be spent off-campus hiking, canoeing, and camping will involve 24-hour commitment. Consent of the Department is required prior to registration.

48. Students must provide their own equipment (squash racquet, squash balls, racquetball racquet, and racquetball balls).

49. Students registered in P ED 234 must be prepared to spend $20.00 on green fees and driving range fees. This will be paid to the Department at the first class meeting. This section is for B.P.E. students only.

50. Students must provide their own tennis racquets.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
POL S 390 *Introduction to Political Behavior*	★3	Lec 10	1st	0730-0950	T 1-104	J. Kenward
PSYCO 260 *Basic Psychological Processes*	★3	Lec 10	1st	1000-1220	BS G-113	TBA
PSYCO 261 *Individual and Social Behavior*	★3	Lec 20	2nd	1000-1220	BS G-113	TBA
PSYCO 341 *Social Psychology*	★3	Lec 20	2nd	0730-0950	BS G-113	
PSYCO 361 *Principles of Behavior Change*	★3	Lec 10	1st	1000-1220	BS P-11[illegible]	
PTHER 463 *Management of Physical Therapy Services*	★3	Lec 20	2nd	0800-1100	C	
REC 390 *Outdoor Programming and Counselling*	★3	Lec 10	1st	1000-1220	PE	
REC 435[51] *Outdoor Recreation Resources*	★3	Lec 10	1st	1000-1220	PE E1-20A	G.S. Swinnerton
RELIG 361 *Religious Symbolism*	★3	Lec 10	1st	1330-1550	HC 1-3	M. Waida
RELIG 363 *Religious Founders*	★3	Lec 10	1st	1000-1220	HC 1-3	F. Lorint
RELIG 390 *Modern Religious Perspectives*	★3	Lec 20	2nd	1800-2020	HC 1-3	F. Lorint
SOC 202 *Introductory Sociology*	★6	Lec 30 Lec 31	Full Full	0730-0950 1000-1220	T 1-107 T 1-107	E. Snider G. Fearn
SOC 301 *Sociology of Sex Roles*	★3	Lec 10	1st	1330-1550	TB 45	A. Harrell
SOC 311 *Statistics and Social Research*	★6	Lec 30 Lab 30 Lec 31 Lab 31	Full Full Full Full	0730-0950 TBA 1330-1550 TBA	T 1-5 T 1-90 	H. Rosenbaum M. Gillespie
SOC 321 *Sociology of Social Problems*	★3	Lec 10	1st	1330-1550	TB 105	P. Saram
SOC 323 *Sociology of Poverty*	★3	Lec 20	2nd	1330-1550	TB 5	H. Gillespie
SOC 324 *Sociology of Deviance and Conformity*	★3	Lec 20	2nd	1330-1550	TB 60	P. Saram
SOC 325 *Criminology*	★3	Lec 10 Lec 11	1st 1st	0730-0950 1000-1220	T 1-93 T 1-93	R.A. Silverman T.F. Hartnagel
SOC 327 *Criminal Justice Administration*	★3	Lec 20	2nd	1000-1220	T 1-5	J. Tanner
SOC 341 *Social Psychology*	★3	Lec 10	1st	1000-1220	TB 45	W.D. Pierce
SOC 351 *Population Concerns*	★3	Lec 10	1st	1330-1550	T 1-107	K. Krotki
SOC 353 *Urban Sociology*	★3	Lec 10	1st	1000-1220	TB 5	L. Kennedy
SOC 361 *Social Organization*	★3	Lec 20	2nd	1000-1220	TB 113	N. Stehr
SOC 368 *Canadian Ethnic and Minority Relations*	★3	Lec 20	2nd	1330-1550	T 1-107	K. Krotki
SOC 371 *The Family*	★3	Lec 10	1st	1000-1220	T 1-90	G. Jarvis
SOC 373 *Social Psychology of Health and Illness*	★3	Lec 10	1st	1000-1220	TB 60	H. Northcott
SOC 374 *Social Organization of Health Care*	★3	Lec 20	2nd	1000-1220	T 1-108	H. Northcott

51. Students should enroll in no other courses during the same term.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
SOC 375 *Sociology of Aging*	★3	Lec 10	1st	1000-1220	TB 105	D. Starritt
SOC 377 *Sociology of Youth*	★3	Lec 20	2nd	1000-1220	TB 87	A. Harrell
SPA 280 *Introduction to Normal Human Communication*	★3	Lec 10	1st	1000-1220	303B CH	G. Holdgrafer
SPA 281 *Survey of Speech Pathology and Audiology*	★3	Lec 10	1st	0730-0950	303B CH	F. Wilson
STAT 336 *Introduction to Statistics*	★3	Lec 30 Lab 30	Full Full	1330-1435 TBA	CA 339	TBA

NOTES

NOTES

The University of Alberta
Summer Session 1981
Schedule of Courses and Timetable

Compiled November 1980

The following Schedule of Courses and Timetable is planned for Summer Session 1981. Information concerning the scheduling of courses for Spring Session 1981 is printed on green stock in this calendar. Students should ensure that their registration applies to the correct Session.

Summer Session 1981 commences on July 6 and ends August 14.

Full Session —July 6-August 14
1st Term —July 6-July 24
2nd Term —July 27-August 14, with classes held on Saturday August 8 in lieu of the Civic Holiday (August 3).

Courses of weight 3 may be offered over the Full Session (July 6-August 14) for one 65 minute period per day, or may be offered for two 65 minute periods per day in either the First or Second Term.

Courses of weight 6 are offered for two 65 minute periods per day over the Full Session. Special circumstances are explained in footnotes.

ADMISSION. Admission is separate and distinct from Registration. A student who has *NEVER* attended The University of Alberta *MUST* apply for admission in addition to completing a Summer Session Registration Form. A $12.00 application fee must accompany the application form and it is to be returned to the Office of the Registrar along with complete and official transcripts of academic records. The deadline for Summer Session is *April 1*.

REGISTRATION PROCEDURES. Each student must complete a Summer Session Registration form. This form must be returned to the students' Faculty Office by the deadline of *April 30.*

Except when otherwise specified, students will be assigned to courses and sections in the order in which their approved registrations are received by the Office of the Registrar. As enrollment in some courses or sections of courses may be limited, students should apply as early as possible in order to secure their preferences. Courses may be withdrawn for such reasons as insufficient enrollment or staffing difficulties.

CHANGES OF REGISTRATION. If a student wishes to withdraw from a course or change from one course to another, he must complete a "Change of Registration" form and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees. The deadline for Change of Registration is *April 30.*

PRE-SESSION STUDY. Courses which require pre-session study are marked with a dagger (†). Students who register in these courses will receive information on pre-session study with confirmation of registration. Courses not marked with a dagger (†) do not require pre-session study.

WITHDRAWAL. If a student wishes to withdraw from the University he must complete a "Withdrawal" form and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees.

TEXTBOOKS. The University maintains a large modern Bookstore in the Students' Union Building, where prescribed textbooks and supplies of all kinds may be purchased. The Bookstore also stocks a wide range of books and other items of special interest to students and faculty.

Classrooms and the name of the instructor assigned to the course or section are indicated but are subject to change. If the instructor has been named and has prescribed textbook(s), if any, this information will be available at the University Bookstore. For courses where this information is not available, enquiries should be directed to the Department.

Should book returns be required, the returns policy for the Bookstore is seven days from the date of purchase and returned items must be accompanied by a sales receipt or C.O.D. receipt. Further returns of books resulting from withdrawal or transfer may be made providing that the books are in an unmarked condition and the student requesting the refund has retained his sales receipt or C.O.D. receipt and in addition has obtained a copy of the withdrawal or change of registration form. This request for return must be made within seven days.

FEES. 261.8 of the Special Sessions Calendar carries a complete listing of instructional and other fees.

An examination schedule follows the Schedule of Courses and Timetable.

The names and locations of buildings used are provided on a map appearing at the back of this Calendar. The following abbreviations are used.

A	Arts Building
AG	Agriculture Building
AH	Assiniboia Hall
BS B	Biological Sciences, Botany Wing
BS C	Biological Sciences, Centre Wing
BS G	Biological Sciences, Genetics Wing
BS M	Biological Sciences, Microbiology Wing
BS P	Biological Sciences, Psychology Wing
BS Z	Biological Sciences, Zoology
C E	Chemistry, East Wing
C W	Chemistry, West Wing
CA	Central Academic Building
CH	Corbett Hall
CJ	Faculté Saint-Jean
CS	Clinical Sciences Building
CT	Campus Towers
DP	Dentistry-Pharmacy
EB	Civil and Electrical Engineering
EDN	Education Building, North Wing
ED	Education Building
EM	Mechanical Engineering
FA	Fine Arts
GS	General Services Building
HE	Home Economics Building
HC	Humanities Centre
LC	Law Centre
MS	Medical Sciences
NPP	North Power Plant
P	Physics Building
PE E	Physical Education, East Wing
PE W	Physical Education, West Wing
PS	Printing Services
RL	Rutherford Library
RS	Rutherford South
SJ	St. Joseph's College
SUB	Students' Union Building
T	Henry Marshall Tory Building
TA	Temporary Laboratory "A"
V	V Lecture Wing of Physics-Chemistry
WI	Art Workshop I

The following time conversion table is provided for your assistance:

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
AM 1 PM	AM 2 PM	AM 3 PM	AM 4 PM	AM 5 PM	AM 6 PM	AM 7 PM	AM 8 PM	AM 9 PM	AM 10 PM	AM 11 PM	noon 12 midnight
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400

Final Examination Schedule

Classes Meeting at		Final Examination Conducted		
Time	*Term*	*Day*	*Date*	*Time*
0730 - 0950	1st Term	Friday,	July 24	0730 - 0930
1000 - 1220	1st Term	Friday,	July 24	1000 - 1200
1330 - 1550	1st Term	Friday,	July 24	1330 - 1530
0730 - 0950	Full Term	Friday,	August 14	0900 - 1200
1000 - 1220	Full Term	Friday,	August 14	1400 - 1700
1330 - 1550	Full Term	Friday,	August 14	1900 - 2200
0730 - 0950	2nd Term	Friday,	August 14	0730 - 0930
1000 - 1220	2nd Term	Friday,	August 14	1400 - 1600
1330 - 1550	2nd Term	Friday,	August 14	1900 - 2100
0730 - 0835	Full Term	Friday,	August 14	0730 - 0930
0845 - 0950	Full Term	Friday,	August 14	1000 - 1200
1000 - 1105	Full Term	Friday,	August 14	1330 - 1530
1115 - 1220	Full Term	Friday,	August 14	1600 - 1800
1330 - 1435	Full Term	Friday,	August 14	1900 - 2100
1445 - 1550	Full Term	Friday,	August 14	2130 - 2330

NOTE: Lectures in full-session courses will continue on July 24. Lectures in Second Term and full-session courses will be held on Saturday, August 8 in lieu of the August 3 holiday.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ACCTG 204	★3	Lec 60	Full	1115-1220	CA 339	TBA
Managerial Information and Control Systems		Lab 60	Full	1330-1435	CA 339	
ACCTG 406	★3	Lec 60	Full	0800-0905	CA 369	TBA
Advanced Managerial Control Concepts		Lec 61	Full	1000-1105	CA 357	TBA
ANTHR 306	★3	Lec 50	1st	0730-0950	T 1-100	T. Ferguson
Introduction to Prehistory						
ANTHR 307	★3	Lec 55	2nd	0730-0950	T 1-100	D. Reshetylo
Introduction to Social and Cultural Anthropology						
ANTHR 330	★3	Lec 50	1st	1000-1220	T 1-100	D. Reshetylo
Technology in Culture						
ANTHR 355	★3	Lec 55	2nd	1000-1220	T 1-100	TBA
Contemporary Canadian Native People						
ANTHR 396	★6	Lec 70	Full	All Day	Strathcona Science Park	TBA
Archaeological Field Training						
ANTHR 480[1]	★6	Lec 75	June 8-July 15	All Day	Montana	D. Young
Method and Theory in Prehistoric Archaeology						
ART H 306	★3	Lec 50	1st	1000-1220	FA 220	TBA
20th Century Art I						
ART H 356	★3	Lec 55	2nd	1000-1220	FA 220	TBA
20th Century Art II						
ART 231[2]	★6	Lcl 60	Full	0800-1250	A 334	TBA
Visual Fundamentals						

1. Restricted enrollment course. Departmental consent required before provisional registration will be approved. This course will be withdrawn unless there is a minimum of 10 students enrolled as of May 8, 1981. Classes will be scheduled June 8-July 15.
2. Students enrolling in this course may not register in another course during the Summer Session.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ART 339[3] *Special Projects in Studio Discipline: Drawing for Design*	★6	Lcl 60	Full	0800-1250	W 1	J. Egler
ART 439[3] *Special Projects in Studio Discipline: Drawing for Design*	★6	Lcl 60	Full	0800-1250	W 1	J. Egler
BIOL 297[4] *Heredity*	★3	Lec 60	Full	1000-1105	BS G-114	R. Bhambani
		Lab 60	Full	1330-1655	TBA	
BIOL 298 *Environmental Biology*	★3	Lec 50	1st	1000-1220	BS B 105	E. Butterworth
		Lab 50	1st	1330-1655	TBA	R. Haag
BOT 304[5] *Field Botany*	★3	Lec 50	1st	1000-1220	BS B-521	M. Ostafichuk
		Lab 50	1st	1330-1655	BS B-521	M. Hickman
CHEM 200 *Introductory University Chemistry*	★6	Lec 60	Full	1000-1220	V 111	D. McMinn
		Lab 60	Full	1330-1655	TBA	
		Sem 60	Full	1700-1800	TBA	
CHEM 250 *Organic Chemistry*	★6	Lec 60	Full	1000-1220	V 106	R. Gedye
		Lab 60	Full	1330-1655	TBA	
CHR T 344 *Catholicism: Late Middle Ages to Modern Times*	★3	Lec 50	1st	1000-1220	SJ 103	A. de Valk
CHR T 364 *Dimensions of Faith*	★3	Lec 55	2nd	1000-1220	SJ 102	D. Geernaert
CLASS 202 *Greek and Roman Mythology*	★3	Lec 50	1st	0730-0950	HC L2	E. M. Williams
CLASS 369 *Early Civilization I*	★3	Lec 50	1st	1000-1220	HC L2	R. C. Smith
CLASS 370 *Early Civilization II*	★3	Lec 55	2nd	1000-1220	HC L2	E. M. Williams
CLASS 475[6] *Practical Methods in Classical Archaeology*	★6	Lec 75	July 2-Aug. 13	All Day	Italy	A. M. Small
CL TX 417 *Selected Topics: Tapestry Techniques*	★3	Lec 55	2nd	1000-1220	HE B16	T. Ewen
		Lab 55	2nd	1330-1655	HE 112	
CL TX 510 *Current Issues in Clothing and Textiles I: Kitchen Planning*	★1	Lec 50	July 6-July 10	1000-1220	PS 333	B. MacLaren
CL TX 511 *Current Issues in Clothing and Textiles II: Clothing for Special Needs*	★1	Lec 50	July 13-July 17	1000-1220	HE 112	A. Kernaleguen
CL TX 512 *Current Issues in Clothing and Textiles III: Textiles Serviceability*	★1	Lec 50	July 20-July 24	1000-1220	PS 308	E. Crown
DANCE 275 *Dance Forms*	★3	Lec 55	2nd	1330-1550	PE E-19	TBA
DRAMA 245 *Introduction to and Development of Oral Communication*	★6	Lbl 60	Full	0900-1220	FA 2-48	T. Bell
DRAMA 251 *Improvisation*	★3	Lbl 60	Full	1100-1350	FA 1-51	TBA

3. ART 339-60 and ART 439-60 will be taught in conjunction. Students enrolling in this course may not register in another course during the Summer Session. Prerequisite: Consent of the Department of Art and Design.
4. Laboratories in BIOL 297-60 will normally be taught two days a week but on an irregular basis.
5. Field work will consist of day trips in Edmonton and surroundings. There will be a $5.00 assessment per student for transportation expenses.
6. Restricted enrollment course. Departmental consent required before provisional registration will be approved. The course will be withdrawn unless there is a minimum of 10 students enrolled as of May 8, 1981.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
DRAMA 552 *Collective Theatre*	★6	Lbl 60	Full	1000-1650	FA 3-121	D. Barnet
ECON 201 *Introduction to Micro-Economics*	★3	Lec 50	1st	1000-1220	TB 5	P. Holl
ECON 202 *Introduction to Macro-Economics*	★3	Lec 55	2nd	1000-1220	TB 5	P. Holl
ECON 331 *Labor Economics*	★3	Lec 50	1st	1000-1220	TB 90	A. Jenkins
ECON 373 *Industrial Organization*	★3	Lec 55	2nd	1000-1220	TB 90	C. Nunn
ECON 381 *Micro-Economic Analysis I*	★3	Lec 50	1st	0730-0950	TB 90	R. Gateman
ECON 382 *Macro-Economic Analysis I*	★3	Lec 55	2nd	0730-0950	TB 90	R. Gateman
ED ADM 401 *The Role of the Teacher*	★3	Lec 50 Lec 55	1st 2nd	0730-0950 0730-0950	EDN 1-112 EDN 1-128	TBA TBA
ED ADM 463 *The Role of the Administrator and the Supervisor*	★3	Lec 55	2nd	1000-1220	EDN 1-128	TBA
ED ADM 465 *Organization and Administration of Instruction in the School*	★3	Lec 50	1st	1000-1220	EDN 1-110	TBA
ED ADM 501 *Evolving Concepts in Educational Administration*	★3	Lec 50	1st	0730-0950	EDN 1-126	TBA
ED ADM 502 *Administrative Processes in Education*	★3	Lec 55	2nd	1330-1550	EDN 1-128	TBA
ED ADM 505 *Selected Topics in Educational Administration I: School-Based Budgeting Implications for the Administration of Schools*	★3	Lec 50	1st	1330-1550	EDN 1-112	TBA
ED ADM 505[7] *Selected Topics in Educational Administration I*	★3	Lec 51	1st	1330-1550	EDN 1-114	TBA
ED ADM 506 *Selected Topics in Educational Administration II: Computing Concepts in Educational Administration*	★3	Lec 50	1st	1330-1550	EDN 1-128	TBA
ED ADM 506[7] *Selected Topics in Educational Administration II*	★3	Lec 55	2nd	1330-1550	EDN 1-130	TBA
ED ADM 521 *Supervision of Educational Personnel*	★3	Lec 50	1st	0730-0950	EDN 2-145	TBA
ED ADM 522 *Selected Topics in Educational Supervision*	★3	Lec 55	2nd	0730-0950	EDN 2-147	TBA
ED ADM 547 *Models for Decision Making*	★3	Lec 50	1st	1330-1550	EDN 2-145	TBA

7. Contents varies from year to year. For information about topics for 1981, students should call the Department of Educational Administration—432-5241.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED ADM 548 *Management of Information Systems*	★3	Lec 55	2nd	1330-1550	EDN 2-145	TBA
ED ADM 551 *Administration of Public Education in Canada*	★3	Lec 50	1st	1330-1550	EDN 1-126	TBA
ED ADM 566 *Operational Finance*	★3	Lec 55	2nd	0730-0950	EDN 2-145	TBA
ED ADM 571 *The Organization of Postsecondary Education*	★3	Lec 55	2nd	1330-1550	EDN 2-147	TBA
ED ADM 645 *Policy Development in Education I*	★3	Lec 50	1st	1000-1220	EDN 7-114	TBA
ED ADM 646 *Policy Development in Education II*	★3	Lec 55	2nd	1000-1220	EDN 7-114	TBA
ED ADU 523 *Administration of Further Education*	★3	Lec 50	1st	1000-1220	EDN 1-110	TBA
ED AV 361 *Audiovisual Communication*	★3	Lec 50	1st	1000-1220	EDN B-131B	TBA
ED AV 363 *Preparation of Instructional Materials*	★3	Lec 50 Lec 55	1st 2nd	1000-1220 1000-1220	EDN B-131A EDN B-131B	TBA TBA
ED CI 309[8] *Introduction to the Teaching of English as a Second Language*	★3	Lec 50	1st	1000-1220	ED 306	J. Patrie
ED CI 323[8] *Introduction to Elementary School Reading Instruction*	★3	Lec 50	1st	0730-0950	ED 276	D. Forster
ED CI 326[8] *Diagnostic Teaching of Reading*	★3	Lec 50 Lab 50	1st 1st	1000-1220 1330-1435	ED 128 TBA	H. Anderson
ED CI 345[8] *Seminar in Group Projects in Elementary Education I: Music Perspectives—Kodaly I*	★3	Lec 50	1st	1000-1220	ED 465 & ED 475	TBA
ED CI 346[8] *Introduction to School Libraries*	★3	Lec 50 Lec 51	1st 1st	1000-1220 1000-1220	ED 315 ED 380	J. Naslund M. Ming
ED CI 348[8, 9] *Reading in Junior High School*	★3	Lec 50	1st	1000-1220	ED 228	W. Wilde
ED CI 349[8, 9] *Reading in Senior High School*	★3	Lec 50	1st	1000-1220	ED 228	W. Wilde
MOV 389[8] *Curriculum and Instruction in Outdoor Education, K-VI*	★3	Lec 50	1st	1000-1220	ED 206	TBA

8. Not open to students on *Elementary Education Generalist* (AD certificate, Transfer or 4-year B.Ed.) *Programs*. Those students completing Plan A or Plan B Programs must leave program slots open for Professional Term including Phase III Practicum.

9. Students may register in only one of ED CI 348 or ED CI 349. These two courses will be taught concurrently.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED CI 404[10] *Curriculum and Instruction in Early Childhood Education*	★6	Lec 60	Full	0930-1150	ED 201 & ED 203	TBA
		Lab 60	Full	1300-1625	University Child Centre (Ring House 3)	
		Lec 61	Full	1330-1550	ED 201 & 203	TBA
		Lab 61	Full	0900-1225	University Child Centre (Ring House 3)	
ED CI 409[8] *Methods and Programs in the Teaching of English as a Second Language*	★3	Lec 55	2nd	1000-1220	ED 228	J. MacDougall
ED CI 412 *Curriculum in Elementary School Social Studies*	★3	Lec 50	1st	1000-1220	ED 221	TBA
ED CI 413 *Instruction in Elementary School Social Studies*	★3	Lec 55	2nd	1000-1220	ED 277	TBA
ED CI 423[8] *The Reading Process: Theory and Observation*	★3	Lec 50	1st	1330-1550	ED 221	M. Cronin
ED CI 424[8] *Reading in Early Childhood Education*	★3	Lec 50	1st	1000-1220	ED 170	M. Affleck
ED CI 425[8] *Reading in Upper Elementary School*	★3	Lec 50	1st	0730-0950	ED 228	B. Voice
ED CI 443[8] *School Library Services*	★3	Lec 55	2nd	1000-1220	ED 315 & ED 380	S. Pritchard
ED CI 445[11] *Seminar in Group Projects in Elementary Education II: Integrating the Arts in the Elementary School*	★3	Lec 50	July 6-20 Nov. 7 See Note	0900-1220	ED 428	W. Laing M. Grayson F. MacCannell J. Vallance
ED CI 445[8] *Seminar in Group Projects in Elementary Education II: Music Perspectives—Kodaly II*	★3	Lec 55	2nd	1330-1550	ED 465 & ED 475	TBA
ED CI 446[8] *Selection of School Library Materials*	★3	Lec 55	2nd	1330-1550	ED 327	TBA
ED CI 452 *Teaching Literature in the Secondary School*	★3	Lec 50	1st	1000-1220	ED 277	J. Oster
ED CI 467 *Teaching Mathematics in Junior High School*	★3	Lec 55	2nd	1000-1220	ED 934	A. Olson
ED CI 497[12] *Conference Seminar: Curriculum Development in Micro-Processing for Business Teachers I*	★3	Lec 50	1st	0730-0950	ED 456	P. Braun

10. First priority for registration will be given to students who require ED CI 404 to graduate in Fall of 1981. Second priority will be given to students who require ED CI 404 to complete their program by December 1981. Third priority will be given to students on a diploma program after graduation. All students must have completed their first three years, i.e. 90 credits and their practicum before taking ED CI 404.

11. Prerequisite of at least 1 year teaching experience in the elementary school. A practical instructional assignment planned during the two-week course is to be completed by November 7, 1981. Students will be expected to attend an evaluation/sharing session on November 7, 1981.

12. Time in addition to that scheduled will be needed for practical component. Consent of Department of Secondary Education required. Priority given to students who register in both ED CI 497-50 and ED CI 498-50.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED CI 497[13] *Conference Seminar: Word Processing for Business Teachers*	★3	Lec 51	1st	1000-1220	ED 456	S. Ubelacker
ED CI 497 *Conference Seminar: The Adolescent and the Junior High School Curriculum*	★3	Lec 52	1st	1000-1220	ED 934	S. Sigurdson
ED CI 497 *Conference Seminar: Curriculum and Instruction in Religious and Moral Education*	★3	Lec 53	1st	1000-1220	ED 382	W. Hrychuk
ED CI 497[29] *Conference Seminar: Developing Communication Strategies and Modules (French)*	★3	Lec 75	July 2-31	All Day	Jonquiere, Quebec	D. Petherbridge
ED CI 498[12] *Conference Seminar: Curriculum Development in Micro-Processing for Business Teachers II*	★3	Lec 50	1st	1000-1220	ED 303	P. Braun
ED CI 498[13] *Conference Seminar: Curriculum Development in Word Processing*	★3	Lec 51	1st	1300-1520	ED 456	S. Ubelacker
ED CI 498[29] *Conference Seminar: Developing AV Material for Modules to include Cultural Elements*	★3	Lec 75	July 2-31	All Day	Jonquiere, Quebec	M. Monod
ED CI 501[14] *Seminar in Elementary Education: Current Developments in Elementary School Mathematics*	★3	Lec 50	1st	0730-0950 1000-1220	ED 934A	G. Cathcart D. Nelson A. Neufeld D. Sawada J. Worth
ED CI 501[15] *Seminar in Elementary Education: Supervising Student Teachers in the 3-Phase Elementary Practicum*	★3	Lec 51	1st	1000-1220	ED 262	M. McNay (coordinator)
ED CI 501[15] *Seminar in Elementary Education: Curriculum in Elementary Science: Recent Developments*	★3	Lec 52	1st	1000-1220	ED 326	M. McNay
ED CI 522[16] *Research in Reading Processes I*	★3	Lec 50	1st	1000-1220	ED 164	Wm. Fagan
ED CI 544[17] *Directed Individual Study in Elementary Education: Curriculum in Elementary Science—Implementation*	★3	Lec 55	2nd	1000-1220	ED 326	M. McNay

13. Consent of Department of Secondary Education required.

14. Registrants must contact Dr. Joan Worth, Department of Elementary Education, at the time of registration for complete details on organization and structure. Students choose 3 of 6 topics. For more complete course description see listing of ED CI courses.

15. Students who register in ED CI 501-51 or ED CI 501-52 may not register in another course in first term of Summer Session.

16. Students wishing to register in ED CI 522-50 may not register in another course in first term of Summer Session. Consent of Department of Elementary Education required. Students should contact E. J. Graham, Room 533 Education South, Phone 432-4273.

17. Students wishing to register in ED CI 544-55 may not register in another course in second term of Summer Session.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED CI 549[18] *Curriculum Development*	★3	Lec 50	1st	0900-1120	ED 265	TBA
ED CI 550[18] *Current Curriculum Development*	★3	Lec 55	2nd	0900-1120	ED 265	TBA
ED CI 596 *Research Methods in Secondary Education*	★3	Lec 50	1st	1000-1220	ED 276	H. Kass
ED CI 598[19] *Conference Seminar in Secondary Education I: Qualitative Approaches to Evaluation in Curriculum Ethnography, Ethnomethodology and Conversational Analysis*	★3	Lec 50	1st	0900-1120	ED 255	P. Rothe
ED CI 698[19] *Conference Seminar in Secondary Education II: Practicum in Qualitative Evaluation*	★3	Lec 55	2nd	0900-1120	ED 255	P. Rothe
ED FDN 431 *The Education of Selected Minority Groups in Western Canada: An Historical Study*	★3	Lec 55	2nd	1000-1220	EDN 1-126	N. Kach
ED FDN 432 *The Education of Native People in Canada: An Historical Study*	★3	Lec 55	2nd	0730-0950	EDN 1-126	B. Titley
ED FDN 441 *History of Educational Thoughts in Modern Times*	★3	Lec 55	2nd	1330-1550	EDN 1-126	K. Mazurek
ED FDN 453 *Logic in Teaching*	★3	Lec 50	1st	1330-1550	EDN 1-107	S. Carson
ED FDN 454 *Social Philosophy and Education*	★3	Lec 50	1st	1330-1550	EDN 1-110	N. Bhattacharya
ED FDN 462 *The Sociology of the School*	★3	Lec 50	1st	0730-0950	EDN 1-107	TBA
ED FDN 463 *Youth, Social Change and Socializing Agencies*	★3	Lec 55	2nd	1000-1220	EDN 1-107	D. Dawson
ED FDN 470	★3	Lec 50	1st	1000-1220	EDN 1-107	D. Pugh
Issues in Contemporary Education		Lec 55	2nd	0730-0950	EDN 1-107	M. Bauer
ED FDN 530 *History of Education in Canada*	★3	Lec 50	1st	1330-1550	EDN 5-106	R. Carney
ED FDN 555 *Moral Concepts in Education*	★3	Lec 55	2nd	1330-1550	EDN 5-106	TBA
ED FDN 560 *Education from a Sociological Perspective*	★3	Lec 50	1st	1000-1220	EDN 5-106	J. Young
ED IND 223 *Practicum I*	★0	Cln 60	Full	TBA	TBA	TBA
ED IND 245 *Introduction to Vocational Technical Education*	★3	Lec 55	2nd	1000-1220	EDN 2-101	TBA

18. Consent of Department of Secondary Education required. Students who register in ED CI 549 and ED CI 550 may not register in another course in Summer Session. ED CI 549 is the prerequisite for ED CI 550. Priority given to registrants in both ED CI 549 and ED CI 550.

19. Consent of Department of Secondary Education required. Students in ED CI 598 and ED CI 698 can not register in another course during Summer Session.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED IND 323 *Practicum II*	★0	Cln 60	Full	TBA	TBA	TBA
ED IND 343 *Practicum III*	★0	Cln 60	Full	TBA	TBA	TBA
ED IND 423 *Practicum IV*	★0	Cln 60	Full	TBA	TBA	TBA
ED IND 496	★3	Lec 50	1st	1000-1220	ED 113	TBA
Individual Directed Study: Microcomputers in Education		Lec 51	1st	1100-1320	ED 113	TBA
		Lec 55	2nd	1000-1220	ED 113	TBA
		Lec 56	2nd	1100-1320	ED 113	TBA
ED IND 498[20] *Individual Directed Study: Welding*	★3	Lec 70	1st	0730-1220	Victoria Comp. High School	D. Polvi
ED IND 511 *Curriculum and Instruction in Industrial and Vocational Education*	★3	Lec 50	1st	1330-1550	EDN 2-101	TBA
ED IND 587[21] *Individual Directed Study: Senior Course in Microcomputers*	★3	Lec 55	2nd	0730-0950	ED 734	TBA
ED PSY 341† *Psychology of Exceptional Children and Youth*	★3	Lec 50	1st	0730-0950	ED 221	J. Goldberg
ED PSY 343†[22] *Education of Exceptional Children and Youth*	★3	Lec 55	2nd	0730-0950	ED 221	A. Lee Hoxter
ED PSY 361[23]	★3	Lec 60	Full	0900-1200	ED 213	TBA
Seminar and Clinical Practicum: Exceptional Children		Lab 60	Full	TBA	TBA	
ED PSY 411† *Introduction to Guidance*	★3	Lec 55	2nd	1000-1220	ED 221	L. Eberlein
ED PSY 473 *Language and Cognition in the Education of the Child*	★3	Lec 60	Full	1000-1105	EDN 1-130	W. Schmidt
ED PSY 497†[26] *Senior Seminar: Early Infant Intervention Programs*	★3	Lec 50	1st	1000-1220	EDN 2-101	G. Kysela
ED PSY 497†[26] *Senior Seminar: Psychology of Teaching Economically Disadvantaged Children*	★3	Lec 51	1st	1330-1550	EDN 2-117	B. Blowers
ED PSY 497†[26] *Senior Seminar: Sex Roles*	★3	Lec 55	2nd	1000-1220	EDN 2-117	T. Laidlaw
ED PSY 497†[26] *Senior Seminar: Mainstreaming Exceptional Children*	★3	Lec 56	2nd	1330-1550	EDN 2-117	C. King
ED PSY 497†[26, 27] *Senior Seminar: The Elementary Counsellor's Role in Affective and Health Education*	★3	Lec 57	2nd	1000-1220	EDN 2-119	G. Fitzsimmons
ED PSY 502	★6	Lec 60	Full	1000-1220	EDN 2-123	TBA
Introduction to Educational Research		Lab 60	Full	TBA	TBA	
ED PSY 512[24]	★6	Lec 60	Full	0900-1200	EDN 2-139	J. Paterson
Seminar and Practicum in Counselling I		Lab 60	Full	TBA	TBA	et al.

20. Students will be required to cover all costs of supplies consumed.
21. ED IND 496, *Individual Directed Study: Microcomputers in Education*, required as prerequisite for ED IND 587.
22. No longer accepted towards a Special Education distributed elective package in the B.Ed. program.
23. Students must be available for the entire morning to participate in field work.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
ED PSY 521†[25] *Interpersonal Relations in Education*	★3	Lec 50	All Day	See Note		P. Koziey
ED PSY 569 *Advanced Education Psychology: Development*	★3	Lec 60	Full	1330-1435	EDN 2-139	W. Schmidt
ED PSY 571 *Advanced Educational Psychology: Learning*	★3	Lec 60	Full	1115-1220	EDN 2-145	J. Kirby
ED PSY 597[26, 26a] *Special Seminars: Curriculum Design and Instructional Strategies for the Hearing Impaired*	★3	Lec 50	July 6-31	Variable	TBA	TBA
ED PSY 597[26, 26a] *Special Seminars: Language Development and Remediation with Hearing Impaired Students*	★3	Lec 51	July 6-31	Variable	TBA	TBA
ED PSY 597†[26] *Special Seminars: Issues in School Psychology*	★3	Lec 52	1st	0730-0950	EDN 2-151	TBA
ED PSY 597†[26, 27] *Special Seminars: The Elementary Counsellor's Role in Affective Education*	★3	Lec 57	2nd	1000-1220	EDN 2-119	G. Fitzsimmons
ENGL 210† *English Literary*	★6	Lec 60	Full	0730-0950	HC 1-7	R. Bailey
ENGL 270† *Reading in Poetry*	★3	Lec 50	1st	0730-0950	HC 1-11	C. Drummond
ENGL 275† *Reading in Prose*	★3	Lec 55	2nd	0730-0950	HC 1-11	P. Padmanabhan
ENGL 288†[28] *An Introduction to the English Language*	★6	Lec 60	Full	1330-1550	HC 1-11	R. Berry
ENGL 309† *Expository Writing*	★6	Lec 60	Full	0730-0950	HC 1-11	R. Glancy
ENGL 333† *Shakespeare*	★3	Lec 55	2nd	1000-1220	HC 1-11	C. Drummond
ENGL 364† *Modern Canadian Drama*	★3	Lec 55	2nd	1000-1220	HC 2-11	J. Taylor
ENGL 385† *The King James Bible in English Literature*	★6	Lec 60	Full	1330-1550	HC 2-11	E. Popham
ENGL 398†[28a] *Children's Literature*	★6	Lec 60	Full	1000-1220	HC 1-15	D. Shklanka
ENGL 676† *The Twentieth Century Novel*	★6	Lec 60	Full	0900-1120	HC 2-14	N. Page
FAM 346 *Courtship and Marriage*	★3	Lec 50	1st	1330-1550	GS 811	J. Montgomery
FAM 460 *Family and Consumer Law*	★3	Lec 55	2nd	1000-1220	LC 113	S.P. Khetarpal
FREN 200 *First Year University French*	★6	Lec 60 Lab 60	Full Full	1000-1220 1330-1435	A 3 A 32	B. Mahadoo

24. Must be taken in conjunction with ED PSY 510 offered in Spring Session 1981. Applications available from the Department of Educational Psychology. Students must make application for both courses prior to Spring Session. In addition to the time scheduled students must be available for practicum experience.

25. Classes will be scheduled 1000-1700, Rm. EDN 2-125 on July 6, all day at an off-campus site near Edmonton July 7-11 and from 1000-1700 in Rm. EDN 2-125, July 22.

26. All sections of ED PSY 497 and ED PSY 597 require written consent of the Department of Educational Psychology.

26a. ED PSY 597-50 and ED PSY 597-51 must be taken concurrently.

27. ED PSY 497-57 and ED PSY 597-57 are taught in conjunction.

28. Registration open to Education students *only*.

28a. Students in the Faculty of Arts may take this course as an outside of the Faculty free option but not for credit towards an English major or minor.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
FREN 301 *Second Year University French*	★6	Lec 60 Lab 60	Full Full	1000-1220 1330-1550	A 319 A 319	Y. Puzo
FREN 370† *Introduction to French Literature of the Nineteenth Century*	★3	Lec 50	1st	1000-1220	HC 2-19	J. Spencer
FREN 380† *Introduction to French Literature of the Twentieth Century*	★3	Lec 55	2nd	1000-1220	HC 2-19	J. Spencer
FREN 390[29] *French Literature for Children*	★3	Lec 75	July 2-July 31	All Day	Jonquiere, Quebec	P. Monod
FREN 408[29] *Third Year French for Honors Language Students*	★3	Lec 75	July 2-July 31	All Day	Jonquiere, Quebec	P. Monod
FR CA 333[29] *Aspects of French-Canadian Civilization and Culture II*	★3	Lec 75	July 2-July 31	All Day	Jonquiere, Quebec	G. Savard
FR CA 499[29] *Directed Reading*	★3	Lec 75	July 2-July 31	All Day	Jonquiere, Quebec	G. Savard
GEOG 251 *Introduction to Cultural Geography*	★3	Lec 50	1st	1000-1220	T 3-58	W. W. Fieguth
GEOG 364 *The Influence of Man on the Natural Environment*	★3	Lec 55	2nd	1000-1220	T 3-58	W. W. Fieguth
GEOL 301 *Earth Science I*	★3	Lec 50	1st	1000-1220	AG 245	TBA
GEOL 302 *Earth Science II*	★3	Lec 55	2nd	1000-1220	AG 245	TBA
GEOL 307 *Earth Science III*	★3	Lec 50	1st	0730-0950	AG 155	TBA
HIST 201 *European History since the Renaissance*	★6	Lec 60	Full	1330-1550	TB 113	A. Hendriksson
HIST 278 *An Introduction to the Study of Canadian History 1500-1867*	★3	Lec 50	1st	1000-1220	TB 81	B. Ferguson
HIST 279 *An Introduction to the Study of Canadian History 1867-1967*	★3	Lec 55	2nd	1000-1220	TB 81	B. Ferguson
HIST 309 *Revolutionary and Nineteenth Century Europe*	★6	Lec 60	Full	1330-1550	TB 5	A. Thimme
HIST 407[37] *Topics in Alberta History*	★3	Lec 70	Full	All Day	PE W1-38	TBA
INT D 302 *Economics of Agriculture*	★3	Lec 50	1st	1000-1220	GS 511	M. Veeman
INT D 446†[30] *Eastern Europe: A Travel Study Course*	★6	Lec 75	July 6-Aug. 14	All Day	Yugoslavia and Poland	T. M. S. Priestly and T. Yedlin
LAW 302[31] *Law for Education Students I*	★3	Lec 50	1st	1000-1220	LC 201	S. P. Khetarpal

29. See §261.16.15 of the white pages for further details.

30. Students require Departmental consent before provisional registration will be approved. This course will be withdrawn unless there is a minimum of 15 students enrolled as of May 8, 1981.

31. Not available for credit in the LL.B. Program.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
LAW 303[31, 32] *Law for Education Students II*	★3	Lec 55	2nd	1000-1220	LC 201	E. P. Mendes
LIB S 423[33] *Archives Administration*	★3	Lec 50	1st	1700-1920	RS 3-01	TBA
		Lab 50	1st	1330-1655	RS 3-01	TBA
LIB S 432†[33] *Survey of Materials for Children*	★3	Lec 60	Full	0845-0950	RS 3-21	TBA
LIB S 523[33] *Records Management*	★3	Lec 55	2nd	1700-1920	RS 3-01	TBA
		Lab 55	2nd	1330-1655	RS 3-01	TBA
LIB S 557[34] *Special Topics in Librarianship: Reference Services for School Librarians*	★3	Lec 50	1st	0730-0950	RS 3-06	R. Brundin
LIB S 557 *Special Topics in Librarianship: Legal Bibliography*	★3	Lec 51	1st	TBA	Saskatoon	M. Richeson
LING 303[35] *Introduction to Linguistics*	★3	Sem 50	1st	1000-1220 & 1330-1550	GS 769 GS 769	E. Rivas-Arráiz
LING 382 *Modern English Syntax*	★3	Lec 55	2nd	1000-1220	GS 769	E. Rivas-Arráiz
MATH 202 *Elementary Calculus I*	★3	Lec 60	Full	0815-0920	CA 335	TBA
		Lab 60	Full	0920-0950	CA 335	TBA
MATH 204 *Elementary Calculus II*	★3	Lec 60	Full	0845-0950	CA 273	TBA
MATH 222 *Linear Algebra II*	★3	Lec 60	Full	1115-1220	CA 335	TBA
MATH 240 *Algebra and Elementary Calculus I*	★3	Lec 60	Full	0815-0945	CA 339	TBA
MATH 243 *Linear Algebra*	★3	Lec 60	Full	1000-1105	CA 339	TBA
MATH 302 *Intermediate Calculus I*	★3	Lec 60	Full	0845-0950	CA 357	TBA
MATH 303 *Intermediate Calculus II*	★3	Lec 60	Full	0845-0950	CA 365	TBA
MATH 415 *Applied Algebra I*	★3	Lec 60	Full	1000-1105	CA 365	TBA
MGTSC 307 *Probability and Statistics for Business Part II*	★3	Lec 60	Full	0845-0950	CA 373	TBA
MOV 201 *Introduction to the Movement Activities of Children Aged 0-8*	★3	Lcl 50	1st	1330-1640	Ed Gym and ED G 208	C. Marshall
MOV 321 *Structure and Strategies of Games*	★3	Lcl 50	1st	1000-1230	Ed Gym and ED G 208	N. Melnychuk
MOV 325 *Introduction to the Scientific Basis of Human Movement*	★3	Lec 55	2nd	1330-1550	Ed Gym and ED G 208	V. Sherwood
MOV 351 *Educational Gymnastics*	★3	Lcl 55	2nd	1000-1220	Ed Gym and ED G 208	B. Potvin
MUSIC 206 *Introduction to Music I*	★3	Lec 50	1st	1000-1220	FA 2-32	L. Cook
MUSIC 207 *Introduction to Music II*	★3	Lec 55	2nd	1000-1220	FA 2-34	M. Bowie
OCCTH 498 *Special Seminars: Remedial Use of Hatha Yoga in Occupational Therapy*	★3	Sem 50	1st	1600-1850	CH 201	M. Gordon

32. Normally LAW 302 would be a prerequisite, but this requirement may be waived at the discretion of the instructor.

33. Consent of the Faculty of Library Science required.

34. Registration restricted to Education students *only*.

35. Students who register in LING 303 should not register in another course during the first term of Summer Session.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
OCCTH 498†[36] *Special Seminars: Use of Creative Arts in Therapy*	★3	Sem 70	July 6- July 17	1000-1220 and 1330-1550	PE E-436	S. Jennings
ORG T 305 *Theory of Formal Organizations*	★3	Lec 60	Full	1115-1220	CA 343	TBA
P ED 210 *Physical Fitness Theory and Practice*	★3	Lec 50	1st	1330-1500	PE E-120	D. Syrotuik
		Lab 50	1st	1510-1730	PE E-447 and PE West Gym
P ED 215 *Introduction to Soccer*	★3	Lec 55	2nd	1330-1550	PE W1-59 PE West Gym South Field	TBA
P ED 223[37] *Boating*	★3	Lec 70	July 7- Aug. 15	All Day	PE W1-38	M. Lund
P ED 227 *Introduction to Aquatics*	★3	Lec 55	2nd	0730-0950	PE West Pool	TBA
P ED 228 *Introduction to Track and Field I*	★3	Lec 50	1st	1330-1550	PE W1-59 Football Field	G. Simonyi
P ED 231[38] *Court Sports*	★3	Lec 60	Full	0730-0810	PE E-120	R. G. Glassford
		Lab 60	Full	0815-0950	PE East Courts	R. G. Glassford
P ED 234[39] *Introductory Golf*	★3	Lec 50	1st	1000-1220	PE E-436 and Lister Field	S. W. Mendryk
		Lec 55	2nd	0730-0950	PE E-436 and Lister Field	P. Lindsay
P ED 236[40] *Racquet Sports*	★3	Lec 50	1st	1330-1550	PE Main Gym and Tennis Courts	TBA
		Lec 55	2nd	1330-1550	PE Main Gym and Tennis Courts	TBA
P ED 240 *Adapted Physical Education*	★3	Lec 50	1st	1000-1220	PE W1-39	TBA
P ED 327 *Advanced Aquatics*	★3	Lec 55	2nd	0730-0950	PE West Pool	TBA
P ED 499[37] *Directed Studies in Wilderness Arts, Crafts and Living Skills*	★3	Lec 70	July 7- Aug. 15	All Day	PE W1-38	M. Kochanski
PHIL 221 *Practical Logic*	★3	Lec 50	1st	1000-1220	HC 1-7	H. Tennessen

36. Students wishing to register in OCCTH 498-70 require consent of the Department of Occupational Therapy. Students must attend both the morning and afternoon sections of this course.

37. This course is one of three half-year courses in History and Outdoor Education (History 407—Topics in Alberta History; P ED 223—Boating; and P ED 499—Wilderness Arts, Crafts, and Living Skills) offered over the period of July 7 to August 15, 1981. History 407 will only be open to students who register in one or both of P ED 223 or P ED 499. The bulk of course activities, lectures and trips will occur before July 28; and the period July 28 to August 15 will be available to the students to complete projects and term papers. Students may register in one to three of these courses, but are expected to participate in all camp activities and pay the full camp fee; therefore students are requested to register in two or three of these half courses. Participation in pre-course readings, a preliminary examination, and a final examination will be required for each course. Students are expected to provide their own sleeping bag, personal gear, some food, and a camp fee of up to $120.00 to cover the cost of transportation, food, and other expenses. During this program the majority of the period July 8 to 27 will be spent off-campus canoeing and camping, and will involve 24-hour commitment. Consent of the Department of Physical Education is required prior to registering in these courses.

38. Students must provide their own equipment (squash racquet, squash balls, racquetball racquet, and racquetball balls).

39. Students registered in P ED 234 must be prepared to spend $20.00 on green fees and driving range fees. This will be paid to the Department at the first class meeting.

40. Students must provide their own tennis racquet.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
PHIL 323 *Philosophy of Mind*	★3	Lec 55	2nd	1000-1220	HC 1-7	W. E. Cooper
PHIL 536 *Phenomenology I*	★3	Lec 50	1st	1330-1550	HC 478	H. P. Reeder
POL S 320 *Canadian National Government and Politics*	★6	Lec 60	Full	1000-1220	T 1-125	G. Pyrcz
POL S 325 *Topics in City Politics*	★3	Lec 50	1st	1330-1550	T 1-129	J. Kenward
POL S 326 *Canadian Foreign Policy*	★6	Lec 60	Full	0730-0950	T 1-103	J. Lejnieks
POL S 328 *Elements of Public Administration*	★3	Lec 55	2nd	1330-1550	T 1-129	J. Kenward
PSYCO 260 *Basic Psychological Processes*	★3	Lec 50	1st	0730-0950	BS P-107	TBA
PSYCO 261 *Individual and Social Behavior*	★3	Lec 55	2nd	0730-0950	BS P-107	TBA
PSYCO 353 *Developmental Psychology*	★3	Lec 55	2nd	0730-0950	BS G-113	TBA
PSYCO 383 *Personality*	★3	Lec 50	1st	1000-1220	BS G-113	TBA
PSYCO 489 *Abnormal Psychology*	★3	Lec 55	2nd	1000-1220	BS G-113	TBA
PTHER 469 *Research Methods in Physical Therapy*	★3	Lec 55	2nd	1400-1700	Calgary	J. Kramer
PTHER 484 *Assessment and Treatment of Joints*	★3	Lcl 50	1st	1400-1700	Calgary	J. Lehman
REC 489 *Selected Topics*	★3	Lec 55	2nd	1000-1220	PE W1-39	TBA
RELIG 351 *Synoptic Gospels*	★6	Lec 60	Full	1000-1220	HC 2-17	P. J. Cahill
RELIG 365 *Comparative Studies in Religious Mythology*	★3	Lec 50	1st	1330-1550	HC 2-17	F. Lorint
RUSS 106[41] *Intensive Beginners' Russian I*	★3	Lec 50	1st	0900-1150 1400-1550	GS 769 GS 769	TBA
		Lab 50	1st	1300-1350	TBA	TBA
RUSS 107[41] *Intensive Beginners' Russian II*	★3	Lec 55	2nd	0900-1150 1400-1550	GS 769 GS 769	TBA
		Lab 55	2nd	1300-1350	TBA	TBA
SOC 202 *Introductory Sociology*	★6	Lec 60	Full	0730-0950	TB 38	D. Mottershead
SOC 301 *Sociology of Sex Roles*	★3	Lec 50	1st	1000-1220	T 1-91	K. Kuhn
SOC 311 *Statistics and Social Research*	★6	Lec 60	Full	1000-1220	T 1-96	H. Krahn
		Lab 60	Full	TBA		
SOC 322 *Canadian Social Issues*	★3	Lec 50	1st	0730-0950	T 1-91	A. Simmons
SOC 323 *Sociology of Poverty*	★3	Lec 55	2nd	1000-1220	TB 70	H. Nasir
SOC 325 *Criminology*	★3	Lec 50	1st	1000-1220	T 1-93	J. Tanner
SOC 327 *Criminal Justice Administration*	★3	Lec 55	2nd	1000-1220	TB 38	J. Tanner
SOC 341 *Social Psychology*	★3	Lec 50	1st	1330-1550	TB 70	D. Pierce

41. This is an *immersion course*. Students should enrol in no other course during the same term. N.B. This *will be taught in Edmonton* not in the USSR.

Course	Weight	Section Type/ No.	Term	Hours	Room	Instructor
SOC 342 *Socialization*	★3	Lec 55	2nd	1330-1550	TB 70	D. Pierce
SOC 351 *Population Concerns*	★3	Lec 55	2nd	1330-1550	T 1-5	G. Jarvis
SOC 353 *Urban Sociology*	★3	Lec 55	2nd	1000-1220	TB 104	W. McVey
SOC 361 *Social Organization*	★3	Lec 50	1st	1000-1220	T 1-90	K. Cunningham
SOC 368 *Canadian Ethnic and Minority Relations*	★3	Lec 55	2nd	1000-1220	TB 117	A. Simmons
SOC 371 *The Family*	★3	Lec 50	1st	1330-1550	T 1-91	K. Kuhn
SOC 375 *Sociology of Aging*	★3	Lec 55	2nd	1000-1220	TB 45	D. Starritt
SOC 377 *Sociology of Youth*	★3	Lec 50	1st	1000-1220	TB 76	W. McVey
SOC 472 *Canadian Society*	★3	Lec 55	2nd	1000-1220	TB 87	K. Cunningham
SOILS 302 *Principles of Soil Science*	★3	Lec 50	1st	1000-1220	AG 150	M. J. Dudas
SPA 487 *Special Topics in Speech Pathology—Articulation Disorders and Management*	★3	Lec 50	1st	1000-1220	CH 303B	R. Shetton
STAT 255 *Elementary Statistics*	★6	Lec 60 Lab 60	Full Full	1330-1550 TBA	CA 343 TBA	TBA
UKR 106[41] *Intensive Beginners' Ukrainian I*	★3	Lec 50 Lab 50	1st 1st	0900-1150 1400-1550 1300-1350	GS 711 GS 711 TBA	TBA
UKR 107[41] *Intensive Beginners' Ukrainian II*	★3	Lec 55 Lab 55	2nd 2nd	0900-1150 1400-1550 1300-1350	GS 711 GS 723 TBA	TBA
ZOOL 325 *Comparative Anatomy of the Vertebrates*	★3	Lec 50 Lab 50	1st 1st	1000-1220 1330-1655	BS CW-306 BS Z-305	M. Haag
ZOOL 341 *Vertebrate Physiology*	★3	Lec 55	2nd	1000-1220	BS G-208	M. Haag

THE UNIVERSITY OF ALBERTA

On-Campus Evening Degree Credit Courses

WINTER SESSION 1981-82

GENERAL INFORMATION

As the Special Sessions Calendar is prepared far in advance of the start of the 1981-82 Winter Session, it is possible that timetable and other changes will be made. Therefore this timetable does not necessarily provide all of the information which a student may need in order to register in on-campus Evening Degree Credit courses. Students are urged to obtain additional and current information from the appropriate Faculty University Calendar, from the University Regulations and Information for Students Calendar, or from the Course Registration Procedures Booklet which may be obtained from the Office of the Registrar after mid-March.

Admission. A student who has never attended The University of Alberta must apply for admission in addition to completing a Course Registration form. The deadline for admission for most undergraduate students for the First Term of the Winter Session is July 2nd.

A $12.00 application for admission fee must accompany each application form submitted by a prospective student who has never attended The University of Alberta or one who has never paid the fee on previous application.

Registration Procedure. Each student must complete Course Registration forms and mail them to the Office of the Registrar by August 13th for on-campus courses (please note the date under "ADMISSION" if you are a new student). Students who are not able to meet the August 19th deadline may register in person during the in-person registration period, September 2-4th. Students are advised to submit their registration forms as soon as possible.

Special Note for Education Students: Students registered in the Faculty of Education may advance register in on-campus Evening Credit courses until *June 1*. After that date students must register during the in-person registration period (in accordance with the published schedule).

Change of Registration. Any student who registers in on-campus Evening Degree Credit courses and who subsequently decides he wishes to change his registration must wait until the period September 8th to 16th to complete a "Change of Registration" form.

Withdrawal. If you wish to withdraw from the University or to cancel your registration, you must complete "Withdrawal" forms for approval by your Dean. The date on which the Dean signs the form will be used in reassessing fees.

Fees. § 261.4 of the Special Sessions Calendar carries a complete listing of instructional and other fees.

Courses. The appearance of a course in the following list does not constitute a guarantee that the course actually will be offered in the forthcoming session.

Other. Since classes which meet on Mondays or Fridays will encounter a statutory holiday in the First Term, instructors are requested to arrange with their classes to make up some or all of the time lost.

The points outlined below should assist you when referring to the timetable of courses:

- OFFICIAL COURSE ABBEVIATIONS FOLLOW EACH SUBJECT HEADING AND MUST BE UTILIZED WHEN COMPLETING COURSE REGISTRATION FORM (e.g. Sociology [s|o|c| |]).
- COURSE SECTION ABBREVIATIONS: LEC—LECTURE, LAB—LABORATORY, SEM—SEMINAR, LCL—LECTURE-LABORATORY, LBL—LABORATORY-LECTURE, DEM—DEMONSTRATION, CLN—CLINIC
- TERM: COURSES ARE OFFERED BOTH TERMS UNLESS OTHERWISE INDICATED IN THE FOLLOWING MANNER:
  - 1—FIRST TERM
  - 2—SECOND TERM
  - S—EITHER TERM
  - V—VARIABLE
- DAYS: M—MONDAY T—TUESDAY W—WEDNESDAY R—THURSDAY F—FRIDAY S—SATURDAY
- THE ABBREVIATION "TBA" MEANS "TO BE ANNOUNCED"

● PLEASE NOTE THE FOLLOWING TIME CONVERSION TABLE:

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	AM	(Noon)
1	2	3	4	5	6	7	8	9	10	11	12
PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	PM	(Mid-night)
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400

● THE NAMES AND LOCATIONS OF BUILDINGS ARE PROVIDED ON A MAP WHICH APPEARS AT THE BACK OF THIS CALENDAR AND THE BUILDING ABBREVIATIONS USED IN THIS TIME TABLE APPEAR BELOW:

Bldg. Abbr.	*Building*
A	Arts
AD	Administration
AG	Agriculture
AH	Assiniboia Hall
AT	Athabasca Hall
BS	Biological Sciences Room numbers in this building include the following abbreviations to designate different parts of the building: B — Botany Wing CW — Centre Wing G — Genetics Wing M — Microbiology Wing P — Psychology Wing Z — Zoology Wing
C	Chemistry E — East Wing W — West Wing
CA	Central Academic
CC	Cancer Clinic
CH	Corbett Hall
CJ	Faculté Saint-Jean (8406 - 91 St.)
CL	Cameron Library
CM	Colonel Mewburn Pavilion
CS	Clinical Sciences
DP	Dentistry-Pharmacy
E	Chemical-Mineral Engineering
EAH	East Asian House (11045 Saskatchewan Drive)
EB	Civil and Electrical Engineering
ED	Education
EDN	Education North Wing
EM	Mechanical Engineering
FA	Fine Arts
GR	Glenrose Hospital (10330 - 111 Ave.)

Bldg. Abbr.	*Building*
GO	Good Samaritan Hospital (97 St. and 71 Ave.)
GS	General Services
HC	Humanities Centre
HE	Home Economics
JUB	Jubilee Auditorium
LC	Law Centre
LH	Lister Hall
MS	Medical Sciences
N	Nuclear Research
NR	Nurses' Residence
PB	Pembina Hall
P	Physics
PE	Physical Education and Recreation
PL	Public Health (Provincial Lab)
PS	Printing Services
RH	Royal Alexandra Hospital (10240 Kingsway Ave.)
RC	Research Council of Alberta
RS	Rutherford Library South
SH	University Health Services
SJ	St. Joseph's College
SL	South Lab
SS	St. Stephen's College Academic Building (not residence)
SU	Students' Union
TA	Temporary Laboratory
T	Henry Marshall Tory
TL	H. M. Tory Lecture Theatre Extension
U	University Hall
UH	University Hospital
V	V Wing of Physics-Chemistry
W1	Art Workshop 1
W2	Art Workshop 2
W3	Art Workshop 3 (Athabasca Hall)

EXAMINATION SCHEDULE

FULL-SESSION AND FIRST-TERM COURSES

Mid-session or Final Examinations (IF ANY) for all on-campus courses offered at 1700 hours or later will be conducted in the LAST regularly scheduled CLASS PERIOD prior to mid-session exam week in December.

FULL-SESSION AND SECOND-TERM COURSES

Final Examinations (IF ANY) for all on-campus courses offered at 1700 hours or later will be conducted in the last regularly scheduled CLASS PERIOD in the second term.

NOTE: RELEVANT DATES ARE PROVIDED IN § 261.4 (ACADEMIC SCHEDULE) OF THIS CALENDAR.

On-Campus Evening Degree Credit Courses

Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ACCOUNTING						
ACCTG 202		(Students in Lec A1 take one of Sem A2-C6; Lec E1 take one of Sem E2-E7; Lec X1 take Sem X1 or X2.)				
	First	Lec X1	M	1830-2120	CA	243
		Sem X1	T	1830-1950	CA	243
		X2	T	2000-2120	CA	243
ACCTG 204		(Students in Lec A1 take one of Lab A2-A3; Lec B1; Lab B2-B3; Lec C1, Lab C2-C3; Lec D-1, Lab D2-D3; Lec E1, Lab E2-E3; Lec F1, Lab F2-F3; Lec G1, Lab G2-G3; Lec H1; Lab H2-H3; Lec X5, Lab X5; Lec J1, Lab J2-J3.)				
	Second	Lec X5	M	1830-2120	CA	239
		Lab X5	T	1830-2020	CA	229
ACCTG 452	First	Lec X1	M	1830-2120	CA	273
		Lab X1	W	1700-1820	CA	289
ACCTG 453	Second	Lec X5	M	1830-2120	CA	273
ADMIN SCOLAIRE						
ADMSC 401	First	Lec X1	R	1900-2150	CJ	
ANTHROPOLOGY						
ANTHR 355	Second	Lec X5	M	1830-2120	T	1 91
ANTHR 392	First	Lec X1	W	1830-2120	T	1 91
ARABIC						
ARAB 100		(Students must take same section number for lecture and lab.)				
	Both	Lec X1	T R	1830-1950	HC	2 41
		Lab X1	T R	2000-2050	HC	2 41
ARAB 300		(Students must take same section number for lecture and lab.)				
	Both	Lec X1	M W	1830-1950	HC 2	41
		Lab X1	M W	2000-2050	HC 2	41
ART						
ART 231	Both	Lcl X1	M W	1830-2120	A	334
		X2	T R	1830-2120	A	334
ART 312		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	Both	Lcl X1	M W	1830-2120	FA	110
ART 322		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	Both	Lcl X1	T R	1830-2120	FA 2	40

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Course Abbr.	No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ART 362			(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
		Both	Lcl X1	T R	1830-2120	FA 1	10
ART 372			(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
		Both	Lcl X1	T R	1830-2120	W 1	
ART 392			(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
		Both	Lcl X1	T R	1830-2120	FA 2	24
ART HISTORY							
ART H 302		First	Lec X1	T	1830-2120	FA 2	20
ART H 352		Second	Lec X5	T	1830-2120	FA 2	20
BOTANY							
BOT 511		Second	Lec X5	R	1900-2150	BS B	409C
BUSINESS							
BUS 401		First	Lec X1	T	1830-2120	CA	235
		Second	X5	W	1830-2120	CA	273
BUS 555		First	Lec X1	W	1830-2120	CA	335
BUS 556		First	Lec X1	T	1830-2120	CA	229
CANADN-FRANCAIS							
CA FR 420		First	Lec X1	M	1900-2150	CJ	226A
CANADIAN STUDIE							
CANST 300			(Open to students in the Canadian Studies program and to others upon consent of the Canadian Studies Committee.)				
		Both	Lec X1	M	1830-2120	HC 3	86
CHEMISTRY							
CHEM 555		First	Lec X1	T R	1700-1820	C E5	36
CHEM 561		Second	Lec X5	T R	1700-1820	C E5	36
CHRISTIAN THEOL							
CHR T 351		Second	Lec X5	M	1830-2120	SJ	102
CHR T 352		First	Lec X1	M	1830-2120	SJ	102
CHR T 370		First	Lec X1	T	1830-2120	SJ	103
CHR T 372		Second	Lec X5	R	1730-2020	SJ	102
CURRICULUM ET METHODOLOGIE							
CU ME 212		First	Lec X1	T R	1500-1620	CJ	
CU ME 216		First	Lbl X1	W	1700-1950	CJ	
CU ME 220		Second	Lbl X5	M W	1700-1820	CJ	
CU ME 339		Second	Lec X1	W	1900-2150	CJ	
CU ME 358		First	Lec X1	W	1900-2150	CJ	208
			Lab X2	TBA			
CU ME 359		Second	Lec X1	W	1900-2150	CJ	208
			Lab X2	TBA			
CU ME 410		Second	Lec X5	R	1900-2150	CJ	
DRAMA							
DRAMA 251			(Limited enrolment course. Students will be advised of their registration status at the first meeting of class, on the basis of priority. Priority categories listed at head of Drama listings.)				
		First	Lbl X1	T R	1830-2120	ED N2	103
		Second	X5	T R	1830-2120	ED N2	103

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ECONOMICS						
ECON 201		(Note: Students are advised to register where possible in sections A1 and A2.)				
	First	Lec X1	T	1830-2120	AG	245
	Second	X5	W	1830-2120	T 1	93
ECON 202		(Note: Students are advised to register where possible in sections B1 and B2.)				
	First	Lec X1	W	1830-2120	T 1	93
	Second	X5	T	1830-2120	T 1	103
ECON 323	First	Lec X1	T	1830-2120	T 1	103
ECON 331	First	Lec X1	T	1830-2120	T 1	93
ECON 341	Second	Lec X5	T	1830-2120	T B	45
ECON 352	First	Lec X1	W	1830-2120	TBA	
ECON 355	Second	Lec X5	R	1830-2120	V	128
ECON 366	First	Lec X1	T	1830-2120	T B	45
ECON 373	First	Lec X1	W	1830-2120	T B	105
ECON 381	First	Lec X1	W	1830-2120	T 1	5
ECON 382	Second	Lec X5	W	1830-2120	T 1	129
EDUCATION—ADMINISTRATION						
ED ADM 501	First	Lec X1	T	1800-2050	ED N7	102
	Second	X5	T	1800-2050	ED N7	102
ED ADM 502	First	Lec X1	T	1800-2050	ED N7	140
	Second	X5	T	1800-2050	ED N7	140
ED ADM 505	First	Lec X1	R	1800-2050	ED N2	123
ED ADM 506	Second	Lec X5	T	1800-2050	ED N1	114
ED ADM 521	First	Lec X1	W	1800-2050	ED N1	130
ED ADM 527	First	Lec X1	M	1800-2050	ED N7	102
ED ADM 542	First	Lec X1	M	1800-2050	ED N2	117
ED ADM 546	Second	Lec X2	R	1800-2050	ED N1	126
ED ADM 551	First	Lec X1	W	1800-2050	ED N7	102
	Second	X5	W	1800-2050	ED N7	102
ED ADM 557	First	Lec X1	M	1800-2050	ED N7	140
	Second	X5	M	1800-2050	ED N7	140
ED ADM 565	Second	Lec X5	W	1800-2050	ED N7	102
ED ADM 566	First	Lec X1	W	1800-2050	ED N2	119
EDUCATION—ADULT						
ED ADU 439	Second	Lec B1	M W	1600-1720	ED	228
ED ADU 460	First	Lec X1	R	1700-1950	TBA	
ED ADU 461	Second	Lec X1	R	1700-1950	TBA	
ED ADU 521	First	Lec X1	T	1830-2120	TBA	
EDUCATION—AUDIOVISUAL						
ED AV 465	Second	Lcl X1	M W	1830-2120	ED	B77
ED AV 467	First	Lcl X1	M W	1830-2120	ED	B77
ED AV 471	First	Lec X1	M	1830-2120	TBA	
ED AV 473	Second	Lcl X1	M	1830-2120	TBA	
ED AV 481	First	Lec X1	T R	1830-2120	ED	155
ED AV 483	Second	Lcl X1	T R	1830-2120	TBA	
ED AV 581	First	Lec X1	TBA	TBA	TBA	
EDUCATION—CURRICULUM & INSTRUCTION						
ED CI 308	First	Lec A1	M W	1630-1750	ED	228
ED CI 309	First	Lec A1	T R	1830-1950	ED	228
ED CI 323	First	Lec X1	W	1830-2120	ED	221
ED CI 346	First	Lec X1	T R	1830-1950	ED	380
ED CI 348	First	Lec Xi	M W	1700-1820	ED	221
ED CI 349	First	Lec X1	M W	1700-1820	ED	221
ED CI 393	First	Lec X1	M	1730-2020	ED	N2-103
ED CI 409	Second	Lec X5	T R	1830-1950	ED	228
ED CI 425	Second	Lec B1	T R	1630-1750	ED	213

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ED CI 443	Second	Lec B1	M W	1630-1750	ED	327
ED CI 446	First	Lec X1	M W	1830-1950	ED	327
ED CI 447	Second	Lec X5	M W	1830-1950	ED	327
	Second	Lab X5	M W	2000-2050	ED	327
ED CI 448	Second	Lec X1	M	1830-2120	ED	934
ED CI 452	First	Lec X1	T	1830-2120	ED	277
ED CI 453	Second	Lec X5	T	1830-2120	ED	277
ED CI 480	First	Lec X1	M	1700-1950	ED	456
ED CI 481	Second	Lec X1	M	1700-1950	ED	456
ED CI 486	First	Lec X1	R	1900-2150	ED	401
ED CI 493	Second	Lec Y1	M	1730-2020	ED	N2-103
ED CI 506	Both	Lec X1	TBA			
		First class M at 1700 in Rm. ED 240 to establish class meeting time.				
ED CI 509	First	Lec X1	TBA		ED N	1-114
		First class meets M at 1830 in Rm ED N 1-114 to establish class meeting time.				
ED CI 510	Second	Lec X5	TBA		ED N	1-114
		First class meets M at 1830 in Rm ED N 1-114 to establish class meeting time.				
ED CI 512	First	Lec X1	TBA		ED	282
		First class meets T at 1700 in Rm. 282 to establish class meeting time.				
ED CI 513	Second	Lec X5	TBA		ED	282
		First class meets T at 1700 in Rm. 282 to establish class meeting time.				
ED CI 516	First	Lec X1	TBA			
		First class meets M at 1700 in ED N 1-130 to establish class meeting time.				
ED CI 517	Second	Lec X5	TBA			
		First class meets M at 1700 in Ed N 1-130 to establish class meeting time.				
ED CI 520	First	Lec X1	M W	1700-1820	ED	314
ED CI 521	Second	Lec X5	M W	1700-1820	ED	314
ED CI 527	First	Lec A1	M W	1630-1750	ED	533a
ED CI 528	Second	Lec B1	M	1630-1920	ED	533a
ED CI 529	First	Lec X1	T R	1700-1820	ED	533a
	Second	Lec X5	M W	1700-1820	ED	533a
ED CI 530	Second	Lec X5	T R	1830-1950	ED	533a
ED CI 537	Second	Lec X5	TBA			
		First class meets T at 1830 in ED 413 to establish a class meeting time.				
ED CI 538	First	Lec X1	TBA			
		First class meets T at 1830 in Rm. 413 to establish class meeting time.				
ED CI 539	First	Lec X1	TBA			
		First class meets T at 1830 in ED 475 to establish class meeting time.				
ED CI 540	Second	Lec X5	TBA			
		First class meets M at 1830 in Rm ED 475 to establish class meeting time.				
ED CI 598	Second	Lec X1	M	1830-2120	ED	218
ED CI 612	First	Lec X1	TBA			
		First class meets T at 1700 in Rm. 282 to establish class meeting time.				
ED CI 613	Second	Lec X5	TBA			
		First class meets T at 1700 in Rm. 282 to establish class meeting time.				
ED CI 616	First	Lec X1	TBA			
		First class meets M at 1700 in Rm. ED N 1-130 to establish class meeting time.				
ED CI 617	Second	Lec X5	TBA			
		First class meets M at 1700 in Rm. ED N 1-130 to establish class meeting time.				

EDUCATIONAL FOUNDATIONS

ED FDN 410	First	Lec X1	T	1830-2120
ED FDN 420	Second	Lec X5	W	1830-2120
ED FDN 422	First	Lec X1	W	1830-2120
ED FDN 430	First	Lec X1	R	1830-2120
ED FDN 431	Second	Lec X5	M	1830-2120
ED FDN 454	Second	Lec X5	T	1830-2120

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ED FDN 456	First	Lec X1	M	1830-2120		
ED FDN 463	Second	Lec X5	R	1830-2120		
ED FDN 501	First	Lec X1	M	1830-2120		
ED FDN 512	Both	Lec X1	R	1830-2120		
ED FDN 521	First	Lec X1	W	1830-2120		
ED FDN 522	Second	Lec X5	W	1830-2120		
ED FDN 540	Second	Lec X5	W	1830-2120		
ED FDN 551	First	Lec X1	W	1830-2120		
ED FDN 555	Second	Lec X5	R	1830-2120		
ED FDN 557	First	Lec X1	R	1830-2120		
ED FDN 560	Second	Lec X5	M	1830-2120		
ED FDN 561	First	Lec X1	T	1830-2120		
ED FDN 563	Second	Lec X5	T	1830-2120		
EDUCATION—INDUSTRIAL & VOCATIONAL						
ED IND 233	Second	Lbl X5	M WR	1700-1950	TA	146
	Second	Sem X5	F	1000-1100	TBA	
ED IND 235	First	Lbl X1	T R	1700-1950	TA	160
	First	Sem X1	F	1000-1100	TBA	
ED IND 436	Second	Lbl X5	T R	1700-1950	TA	160
	Second	Sem X5	F	1000-1100	TBA	
ED IND 465	First	Lec X1	M	1700-1950	TBA	
ED IND 589	First	Lec X1	W	1700-1950	TBA	
ED IND 591	Second	Lec X5	W	1700-1950	TBA	
EDUCATIONAL PSYCHOLOGY						
ED PSY 341	First	Lec X1	M	1830-2120		
ED PSY 343	Second	Lec X5	M	1830-2120		
ED PSY 411	First	Lec X1	T	1830-2120		
	Second	Lec X5	W	1830-2120		
ED PSY 469	Second	Lec X5	T	1830-2120		
ED PSY 471	Second	Lec X5	W	1830-2120		
ED PSY 497	First	Lec X1	TBA			
	Second	Lec X5	TBA			
ED PSY 511	Second	Lec X5	W	1700-1950		
ED PSY 513	First	Lec X1	W	1700-1950		
		Lab X1	TBA			
ED PSY 515	First	Lec X1	T	1700-1950		
	Second	Lec X5	W	1830-2120		
ED PSY 517	Second	Lec X5	R	1830-2120		
ED PSY 531	First	Lec Y1	W	1700-1950		
	Second	Lec Y5	W	1700-1950		
ED PSY 535	Second	Lec Y5	M	1700-1950		
ED PSY 537	Second	Lec Y5	T	1700-1950		
ED PSY 539	First	Lec Y1	T	1700-1950		
ED PSY 569	First	Lec X1	T	1700-1950		
	Second	Lec X5	T	1700-1950		
ED PSY 571	First	Lec X1	W	1830-2120		
ED PSY 578	Both	Lec X1	M	1800-2050		
ED PSY 598	Both	Lec C1	M	1630-1920		
		Lab C1	TBA			
ENGLISH						
ENGL 200	Both	Lec X1	T	1830-2120	HC L	3
ENGL 210	Both	Lec X1	W	1830-2120	T B	29
		X2	R	1830-2120	HC 2	11
ENGL 215	First	Lec X1	W	1830-2120	HC 2	15
		X2	R	1830-2120	HC 2	15
ENGL 275	Second	Lec X5	T	1830-2120	HC 2 26	
ENGL 284	Second	Lec X5	T	1830-2120	HC 1	15
ENGL 288		(Education students only.)				
	Both	Lec X1	W	1830-2120	HC L	3

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
ENGL 309		(Restricted enrollment course. Priority to Education students.)				
	Both	Lec X1	T	1830-2120	HC 2	38
ENGL 311	First	Lec X1	R	1830-2120	HC L	3
ENGL 313	Second	Lec X5	R	1830-2120	HC L	3
ENGL 356	Both	Lec X1	R	1830-2120	HC 1	3
ENGL 366	First	Lec X1	T	1830-2120	HC 1	3
ENGL 374	Second	Lec X5	W	1830-2120	HC 1	3
ENGL 377		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	First	Lec X1	T	1830-2120	HC 1	15
ENGL 379		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	Second	Lec X5	T	1830-2120	HC 1	3
ENGL 385	Both	Lec X1	W	1830-2120	HC 2	14
ENGL 398		(Open to Education students only.)				
	Both	Lec X1	R	1830-2120	HC 2	14
ENGL 407		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	Both	Lec X1	W	1830-2120	HC 4	59
ENGL 408		(Restricted enrolment course. Provisional registration only will be granted. Registration status will be confirmed in first week of classes.)				
	Both	Lec X1	W	1830-2120	HC 2	19
FOODS AND NUTRITION						
FD NU 325	First	Lec X1	M	1830-2120	ED	129
		Lab X2	TBA			
FD NU 326	First	Lec X1	M	1830-2120	TBA	
FINANCE						
FIN 456	First	Lec X1	M	1830-2120	CA	235
FIN 563	First	Lec X1	R	1830-2120	CA	339
	Second	X5	M	1830-2120	CA	235
FONDEMENTS L'EDUCATION						
FO ED 452	Second	Lec X5	T	1900-2150	CJ	208
FOREST SCIENCE						
FOR 463	Second	Lec X5	T	1830-2120	E	343
FRENCH						
FREN 100		(For a student to be registered in French 100, he/she must be registered in both the MW and TR segments of the same section. Students without FRENCH 30 who are Francophone or who have some years of French attempts the 30-Level Placement Exam in ARTS 102.)				
	Both	Lec X1	M W	1700-1750	A	3
		X1	T R	1700-1820	A	3
FREN 200		(1st year Arts students registering in FREN 200 Lec A1 cannot register in a second French course in Second Term. Students with FRENCH 31 and Francophone students register in FRENCH 202 or FRENCH 230.)				
	Both	Lec X1	M WR	1700-1750	A	143
		Lab X1	T	1700-1750	A	8A
FREN 201		(Students in Lec C1, C2 and X1 take Lab C1, C2 or X1.)				
	Both	Lec X1	M W	1700-1815	A	135
		Lab X1	T R	1700-1750	A	11
GEOGRAPHY						
GEOG 230		(Students in Lec A1 take one of Lab A2-A9; Lec 1 take one of Lab B2-B9; Lec C1 take one of Lab C2-C9; Lec X5 take one of Lab X6-X9.)				
	Second	Lec X5	T	1830-2120	T B	95
		Lab X6	R	1830-2020	T 3	70
		X7	R	1830-2020	T 3	76
		X8	R	1830-2020	T 3	58
		X9	R	1830-2020	T 3	65

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
GEOG 231		(Students in Lec B1 take one of Lab B2-B9; Lec C1 take one of Lab C2-C9; Lec D1 take one of Lab D2-D9; Lec X1 take one of Lab X2-X5.)				
	First	Lec X1	T	1830-2120	T B	95
		Lab X2	R	1830-2020	T 3	70
		X3	R	1830-2020	T 3	76
		X4	R	1830-2020	T 3	58
		X5	R	1830-2020	T 3	65
GEOG 250	First	Lec X1	M	1830-2120	T B	45
GEOG 251	Second	Lec X5	M	1830-2120	T B	87
GEOG 360	Second	Lec X5	W	1830-2120	T 3	58
GEOG 364	Second	Lec X5	T	1830-2120	TL B	2
GEOG 366	First	Lec X1	T	1830-2120	T 3	58
GEOG 381	First	Lec X1	T	1830-2120	T B	87
GEOG 438	First	Lec X1	M	1830-2120	T 2	99
GEOG 439	Second	Sem X5	M	1830-2120	T 2	99
GEOG 458	First	Sem X1	W	1830-2120	T 3	58
GEOG 465	First	Lec X1	W	1830-2120	T 2	99
		Lab X2	Field Work			
GEOG 466	First	Lec X1	W	1830-2120	T 2	99
GEOG 481	Second	Lec X5	T	1830-2120	T 2	87
GEOG 510	First	Sem X1	R	1900-2150	T 3	123
GEOG 529	Second	Sem X5	R	1830-2120	T 3	2
GEOG 531	First	Sem X1	W	1830-2120	T 3	4
GEOG 532	Second	Sem X5	W	1830-2120	T 3	4
GEOG 536	First	Sem X1	M	1900-2150	T 3	4
GEOLOGY						
GEOL 300	Both	Lab X1	W	1830-2120	BS M	130
GEOL 301	First	Lec X1	M	1830-2120	AG	345
GEOL 302	Second	Lec X5	M	1830-2120	AG	345
GEOL 588	First	Lcl X1	T R	1830-2120	AG	363
GEOL 631	First	Sem X1	TBA			
GERMAN						
GERM 100		(For students who have no German background. Must take same section number for Lec and Lab.)				
	Both	Lec X1	M W F	1700-1750	A	46
		Lab X1	T R	1700-1750	A	36
HEBREW						
HEB 100		(Students must take same section number for lecture and lab.)				
	Both	Lec X1	M W	1830-1950	HC 2	30
		Lab X1	M W	2000-2050	HC 2	30
HEB 300		(Students must take same section number for lecture and lab.)				
	Both	Lec X1	T R	1830-1950	HC 2	17
		Lab X1	T R	2000-2050	HC 2	17
HISTORY						
HIST 278	First	Lec X1	M	1830-2120	T B	38
HIST 279	Second	Lec X5	M	1830-2120	T B	38
HIST 309	Both	Lec X1	M	1900-2150	T 2	44
HIST 316	Second	Lec X5	W	1830-2120	T 2	39
HIST 334	First	Lec X1	M	1800-2050	T 2	39
HIST 336	Second	Lec X5	M	1800-2050	T 2	39
HIST 347	Second	Lec X5	T	1830-2120	T 2	39
HIST 360	Both	Lec X1	T R	1900-2020	T 1	100
HIST 371	First	Lec X1	T	1830-2120	T B	38
HIST 372	Second	Lec X5	T	1830-2120	T 2	44
HIST 384	Both	Lec X1	W	1800-2050	T 2	44
HIST 387	Second	Lec X5	M	1830-2120	T 2	52
HIST 388	First	Lec X1	M	1830-2050	T 2	52
HIST 434	First	Sem X1	M	1830-2020	T B	100

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
HIST 439		(Restricted enrolment course.)				
	First	Sem X1	W	1900-2150	T 2	52
HIST 495	First	Sem X1	T	1830-2050	T B	104
HIST 496		(Restricted enrolment course.)				
	Second	Sem X5	T	1830-2050	T B	104
INDUSTRIAL RELATIONS						
IND R 471	First	Lec X1	T	1830-2120	CA	239
INTERDEPARTMENTAL COURSE						
INT D 346	Both	Lec X1	M	1830-2120	AT	311
INT D 355	First	Lec X1	W	1830-2120	T B	5
INT D 369	Second	Lec X5	T	1830-2120	T	365
INT D 443		(Section cancelled.)				
	Second	Lec X1	W	1830-2120	AT	311
INT D 445	First	Lec X1	R	1830-2120	AT	311
INT D 565	Second	Lec X5	W	1830-2120	T 3	36
JAPANESE						
JAPAN 201	First	Lec X1	M W	1800-1950	T B	104
JAPAN 202	Second	Lec X5	M W	1800-1950	T B	104
LEGAL RELATIONS						
LEG R 310		(Lec A2, A3, A4, A9, B2, B3, B4, B6 normally will meet twice a week.)				
	First	Lec X1	W	1900-2150	CA	269
	Second	X5	M	1830-2120	CA	269
		X6	W	1830-2120	CA	269
LEG R 519	First	Lec X1	R	1830-2120	CA	357
	Second	X5	W	1830-2120	CA	343
LEG R 570	First	Lec X1	M	1830-2120	AT	330
LIBRARY SCIENCE						
LIB S 412		(Restricted enrolment course. Sutdents must obtain consent of Faculty. Provisional registration will be approved.)				
	Second	Lec X5	W	1830-2120	RS 3	22
LIB S 432		(Restricted enrolment course. Students must obtain consent of Faculty. Provisional registration will be approved.)				
	First	Lec X1	W	1830-2120	RS 3	22
LIB S 434		(Restricted enrolment course. Students must obtain consent of Faculty before provisional registration will be approved.)				
	Second	Lec X5	T	1830-2120	RS 3	6
LIB S 436		(Open to LIB S students only.)				
	Second	Lec X5	M	1830-2120	RS 3	2
LIB S 472		(Open to LIB S students only. Consent of Faculty required.)				
	First	Lec X1	R	1830-2120	RS 3	6
LIB S 571		(Open to LIB S students only.)				
	First	Lec X1	T	1830-2120	RS 3	22
LINGUISTICS						
LING 303		(Students enrolled in Lec X1 must take Sem X1.)				
	First	Lec X1	T	1830-2120	GS	711
		Sem X1	W	1830-2020	GS	559
LING 382	Second	Lec X5	T	1830-2120	GS	711
LING 599	First	Sem X1	W	1830-2120	GS	749
MANAGERIAL ECONOMICS						
MANEC 463	First	Lec X1	M	1830-2120	CA	235
MANEC 464	Second	Lec X5	W	1830-2120	EM 3	4
MANEC 569	Second	Lec X5	M	1830-2120	EB	344
MARKETING						
MARK 458	Second	Lec X5	W	1830-2120	CA	335
MARK 561	Second	Lec X5	T	1830-2120	CA	335

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
MATHEMATICS						
MATH 202		(Students must register in one lab section.)				
	First	Lec X1	M W	1900-2020	CA	657
		Lab X1	W	2030-2120	CA	239
MATH 204	Second	Lec X5	M W	1900-2020	CA	281
MATH 240		(Students are reminded that MATH 240 classes meet four hours per week. You must fit all four hours into your timetable.)				
	First	Lec X1	M W	1900-2050	CA	229
MATH 243	Second	Lec X5	M W	1830-1950	CA	357
METEOROLOGY						
METEO 320	Second	Lec X5	T R	1830-1920	T 2	99
		Lab X6	R	1930-2130	T 2	99
MANAGEMENT SCIENCE						
MGTSC 459	First	Lec X1	T	1830-2120	CA	273
MGTSC 461	Second	Lec X5	T	1830-2120	CA	239
MGTSC 462	Second	Lec X5	R	1830-2120	CA	289
OCCUPATIONAL THERAPY						
OCCTH 405	First	Lec X1	M	1630-1920	CH	201
		(Will be offered only if enrollment warrants.)				
OCCTH 406	Second	Sem X5	T	1630-1920	CH	201
		(Will be offered only if enrollment warrants.)				
ORGANIZATIONAL ANALYSIS						
ORG A 470	First	Lec X1	R	1830-2120	CA	357
	Second	X5	R	1830-2120	CA	269
ORG A 472	Second	Lec X5	T	1830-2120	CA	269
ORG A 552	Second	Lec X5	R	1830-2120	CA	343
ORG A 557	First	Lec X1	M	1830-2120	CA	357
ORG A 565	First	Lec X1	T	1830-2120	CA	335
ORGANIZATION THEORY						
ORG T 421	Second	Lec X5	W	1830-2120	CA	235
ORG T 441	Second	Lec X5	T	1830-2120	CA	339
ORG T 446	First	Lec X1	T	1830-2050	A	120
PHYSICAL EDUCATION						
P ED 204		(BPE students only.)				
	First	Lab X1	W	1830-2120	PE E	412
P ED 309		(BPE students only. Seminars will be conducted in first term on Sept. 23, Oct. 14, Nov. 4, and Nov. 25 in PE E-120 from 1700-1750.)				
	Both	Lec X1	W	1700-1750	PE E	120
P ED 360		(BPE students only. Students must attend seminars on Sept. 9 in PE E-120 from 2000-2050.)				
	Both	Lbl X1	Field Work			
P ED 409		(BPE students only. Seminars will be conducted in first term on Sept. 16, Oct. 7, Oct. 28 and Nov. 18 in PE E-120 from 1700-1750.)				
	Both	Lec X1	W	1700-1750	PE E	120
		X1	TBA			
P ED 440		(For BPE students only.)				
	Both	Lec X1	M	1830-1850	PE E	436
		Lab X1	Field Work			
P ED 460		(Students must attend seminars on Sept. 9 in PE E-120A from 1900-2020. For BPE students only.)				
	Both	Lec X1	Field work			
P ED 551	First	Lec X1	M	1700-1750	PE E	470
		Sem X1	M	1800-1950	PE E	470
P ED 553	Second	Lec X5	M	1700-1750	PE E	470
		Sem X5	M	1800-1950	PE E	470
P ED 561	First	Sem X1	T	1900-2150	PE E	470

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
P ED 573	Second	Sem X5	T	1700-1950	PE E	424
P ED 589	First	Lec X1	W	1900-1950	PE E	424
		Sem X1	W	2000-2150	PE E	424
P ED 653	Second	Sem X5	T	1900-2150	PE E	436
P ED 695	Second	Sem X5	T	1900-2150	PE E	470
PHYSICAL SCIENCE						
PH SC 341	Both	Lec X1	T	1830-2120	V	128
PHILOSOPHY						
PHIL 221	Second	Lec X5	W	1830-2120	HC L	2
PHIL 230	First	Lec X1	M	1830-2120	HC L	2
PHIL 302	First	Lec X1	W	1830-2120	SJ	102
PHIL 303	Second	Lec X5	W	1830-2120	SJ	102
PHIL 323	First	Lec X1	W	1830-2120	HC L	2
PHIL 465	First	Lec X1	R	1830-2120	HC 2	34
PHIL 512	First	Lec X1	T	1830-2120	HC 4	78
PHIL 537	Second	Lec X5	W	1830-2120	HC 4	78
PHIL 563	First	Lec X1	R	1830-2120	HC 4	78
PHILOSOPHIE						
PHILE 354	Both	Lec X1	R	1900-2150	CJ	208
PHYSICS						
PHYS 304	Both	Lec X1	M W	1700-1820	P	145
PHYSIOLOGY						
PHYSL 507	Second	Lec X5	W	1930-2220	PE E	452
		X5	W	1930-2220	PE E	436
POLITICAL SCIENCE						
POL S 201	First	Lec X1	TBA			
POL S 202	Second	Lec X5	R	1900-2150	T 1	91
POL S 312	First	Lec X1	R	1900-2150	T 1	104
POL S 363	First	Lec X1	W	1830-2120	T B	60
POL S 410	First	Lec X1	R	1900-2150	T 11	9
POL S 422	Second	Lec X5	W	1900-2150	T B	81
POL S 458	First	Lec X1	W	1830-2120	T B	125
POL S 475	First	Lec X1	T	1830-2120	T B	125
POL S 493	Second	Lec X5	T	1830-2120	T 11	9
POL S 510	Both	Lec X1	T	1900-2150	T 1	83
POL S 511	First	Lec X1	R	1900-2150	T 11	13
PSYCHOLOGY						
PSYCO 260	First	Lec X1	T R	1830-1950	T 1	91
PSYCO 261	Second	Lec X5	T R	1830-1950	BS M	141
PSYCO 337	Second	Lec X5	T	1830-2120	BS G	116
PSYCO 341	First	Lec X1	M	1830-2120	T B	5
PSYCO 353	Second	Lec X5	T	1830-2120	BS M	149
PSYCO 383	First	Lec X1	T R	1830-1950	BS P	116
PSYCO 489	Second	Lec X5	T R	1830-1950	BS M	145
RECREATION						
REC 551	Second	Lec X5	W	1830-2120	PE W1	14
RELIGIOUS STUDY						
RELIG 300	Both	Lec X1	R	1830-2120	HC 2	21
RELIG 338	Both	Lec X1	T	1830-2120	HC 2	21
RELIG 363	Second	Lec X1	W	1830-2120	HC 2	21

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Course Abbr. No.	Term	Section Typ/No.	Days	Hours From To	Bldg.	Room
SOCIOLOGY						
SOC 202	Both	Lec X1	T	1830-2120	T 1	90
SOC 301	First	Lec X1	W	1830-2120	T B	95
SOC 311	Both	Lec X1	W	1830-2120	T B	38
SOC 321	Second	Lec X5	M	1830-2120	T 1	119
SOC 322	First	Lec X1	M	1830-2120	T 1	5
SOC 323	First	Lec X1	T	1830-2120	T B	29
	Second	Lec X5	T	1830-2120	T B	5
SOC 324	First	Lec X5	T	1830-2120	T B	5
SOC 325	First	Lec X5	W	1830-2120	T B	45
SOC 327	Second	Lec X5	TBA			
SOC 332	First	Lec X1	R	1830-2120	T B	100
SOC 333	Second	Lec X5	R	1830-2120	T B	100
SOC 341	Second	Lec X5	R	1830-2120	T 1	91
SOC 344	First	Lec X1	M	1830-2120	T 1	119
SOC 361	Second	Lec X5	W	1830-2120	T B	113
SOC 371	First	Lec X1	M	1830-2120	T B	87
	Second	X5	W	1830-2120	T B	87
SOC 375	Second	Lec X5	M	1830-2120	T 1	103
SOC 447	Second	Lec X5	R	1700-1950		
SOC 450	Second	Lec X5	W	1830-2120	T B	109
SOC 544	Second	Sem X5	W	1830-2120	T 4	10
SOC 575	Second	Sem X5	TBA			
SPANISH						
SPAN 100		(Students must take same section number for Lec and Lab.)				
	Both	Lec X1	T R	1700-1820	HC 2	29
		Lab X1	M W	1700-1750	HC 2	29
SPAN 300		(Students must take same section number for Lec and Lab.)				
	Both	Lec X1	M W	1700-1820	HC 1	15
		Lab X1	R	1700-1750	HC 1	15
STATISTICS						
STAT 241		(Students must take same section number for Lec and Lab. Labs are unscheduled. Students may complete weekly Lab in CA 331 any day between 0900 and 1600.)				
	Second	Lec X1	M W	1900-2020	V	103
		Lab X1	M W	2030-2120	V	103
UKRAINIAN						
UKR 100		(Students must take same Lec and Lab section number.)				
	Both	Lec X1	M W	1900-2020	GS	711
		Lab X1	T R	1900-1950	A	18
UKR 200		(Students must take same Lec and Lab section number.)				
	Both	Lec X1	T R	1700-1820	GS	711
		Lab X1	W	1700-1750	GS	711

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The University of Alberta
Evening Credit Program (Off-Campus)

Schedule of Courses and Timetable

Compiled December 1980

Evening Credit Program (Off-Campus) 1981-82

The courses listed below are planned for the Evening Credit Program (Off-Campus) 1981-82 in centres outside Edmonton.

SCHEDULING. Courses normally scheduled Monday, Tuesday, Wednesday or Thursday will meet once a week from 1830 to 2130 on the day indicated. Courses scheduled Friday-Saturday will normally meet from 1830-2130 on Friday and 0900-1200 on Saturday every other week commencing on the dates indicated. Exceptions to this general rule which were known when this Calendar was printed are noted in the schedule.

Because some classes will encounter statutory holidays, instructors are requested to make mutually satisfactory arrangements with their classes to make up some or all of the time lost.

ADMISSION. Admission is separate and distinct from Registration. A student who has never attended The University of Alberta must apply for admission in addition to completing an Evening Credit Registration form. A $12.00 application fee must accompany the application form and it is to be returned to the Office of the Registrar along with complete and official transcripts of academic record.

The deadline for Application for Admission to most Faculties of The University of Alberta is *July 2* (June 1 for the Faculty of Education) for courses commencing in September. For courses commencing in January, the deadline for Application for Admission is *November 2* for the Faculty of Education, and *December 1* for other faculties.

Application forms are available from the Office of the Registrar, The University of Alberta.

REGISTRATION. Unless otherwise indicated in a footnote to the course in the Schedule of Courses and Timetable, students who have been admitted may register in-person or by mail prior to the commencement of classes or may register at the first meeting of the class. All registrations must be approved by the Faculty Office. (Due to possible delays in the mail students who have not registered by August 28 are advised to delay their registration to the first class meeting.)

Registration in some courses and sections is limited, and students will be assigned to them in the order in which approved registrations are received by the Office of the Registrar. A course may be withdrawn for such reasons as low enrollment, staffing difficulties, or changes in the schedule of public transportation.

CHANGE OF REGISTRATION. If a student wishes to withdraw from a course or change from one course to another, he must complete a "Change of Registration" form and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees. Forms are available from the Office of the Registrar, The University of Alberta.

WITHDRAWAL. If a student wishes to withdraw from the University, or withdraw from a course, he must complete a "Withdrawal" form and submit it for approval by his Dean. The date on which the Dean signs the form will be used in reassessing fees. Forms are available from the Office of the Registrar, The University of Alberta.

FEES. 261.9 of the Special Sessions Calendar carries a complete listing of instructional and other fees.

EXAMINATIONS. All, or part of the last class in December may be used for midterm examinations in full-session courses or final examinations in First Term courses. Final examinations in full-session courses and Second Term courses will be held during the last class in the Second Term. Evening Credit Program (Off-Campus) classes will not be held during the Second Term reading week February 22-February 28, but courses scheduled for every other week on Friday-Saturday for a total of 6 hours Friday evening and Saturday morning will continue to provide seven meetings for a half course and fourteen meetings for a full course.

OTHER. At The University of Calgary, Grande Prairie Regional College, Lakeland College, and Red Deer College, The University of Alberta degree credit courses are often offered by The University of Alberta. In each case, the courses carry University of Alberta credit, and registration is through the Registrar of the University of Alberta. Students are advised to contact the Colleges directly for information on College courses.

The course weight given for each course below is the same as that for the Winter Session. In this Calendar ★3 denotes a single-term course, ★6 a full-session course. Sections are numbered 91, 92, etc. in ascending order.

The following time conversion table is provided for your assistance:

0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200
AM 1 PM	AM 2 PM	AM 3 PM	AM 4 PM	AM 5 PM	AM 6 PM	AM 7 PM	AM 8 PM	AM 9 PM	AM 10 PM	AM 11 PM	noon 12 midnight
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400

ADDITIONAL COURSES FOR 1981-82

Throughout the year additional courses are added to the program. For an up to date listing of courses planned for 1981-82 please write or call the following:

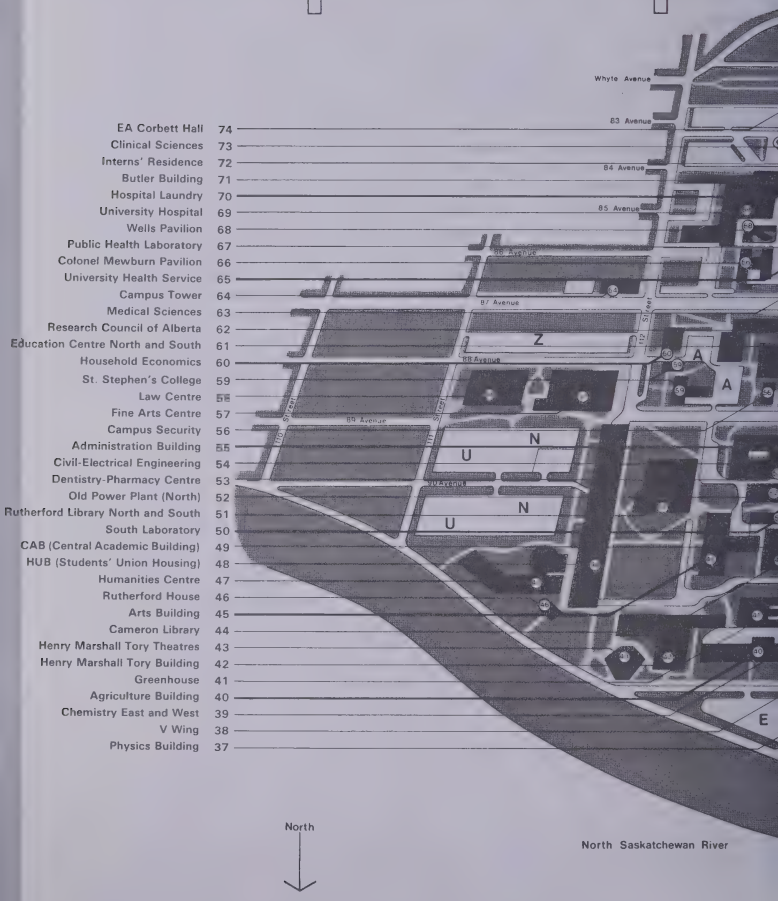
Joe Daniel
Assistant Admissions Officer
Office of the Registrar
128 Administration Building
The University of Alberta
Phone: 432-4537

Monda Wadsworth
Administrative Officer
Special Sessions
4-107 Education II
The University of Alberta
Phone: 432-3752

Course and Centre	Weight	Section	Term	Day and Hour	Location	Instructor
CALGARY						
PTHER 311 *Biomechanics in Physical Therapy*	★3	Lec 91 *First class meeting Jan. 6	2nd	W 1830-2130	University of Calgary	TBA
RED DEER						
ED ADM 565 *Educational Finance*	★3	Lec 91 *First class meeting Sept. 15	1st	T 1830-2130	Red Deer College	TBA
ED ADM 542 *Adaptive Processes in Educational Organizations*	★3	Lec 91 *First class meeting Jan. 5	2nd	T 1830-2130	Red Deer College	TBA
ED CI 309 *Introduction to the Teaching of English as a Second Language*	★3	Lec 91	1st	TBA 1830-2120	Red Deer College	J. Mac Dougall
ED CI 345 *Seminar in Group Projects in Elementary Education I: Elementary School Science*	★3	Lec 91	2nd	TBA 1830-2130	Red Deer College	B. Shapiro
ED CI 409 *Methods and Programs in the Teaching of English as a Second Language*	★3	Lec 91	2nd	TBA 1830-2130	Red Deer College	J. Mac Dougall
ED PSY 411 *Introduction to Guidance*	★3	Lec 91 *First class meeting Sept. 14	1st	M 1830-2130	Red Deer College	TBA
ED PSY 419 *Educational and Vocational Guidance in the Classroom*	★3	Lec 91 *First class meeting Jan. 4	2nd	M 1830-2130	Red Deer College	TBA
NURS 467 *Interpersonal Skills for the Promotion of Self-Care*	★4 	Lec 91 Cln 91 *First class meeting Sept. 8	1st 1st	T 1730-2020 T TBA	Red Deer College	TBA
NURS 468 *Assessment of Self-Care of Individuals*	★4 	Lec 91 Cln 91 *First class meeting Jan. 5	2nd 2nd	T 1730-2020 T TBA	Red Deer College	TBA
RELIG 350 *Jesus of Nazareth*	★3	Lec 91 *First class meeting Sept. 14	1st	M 1830-2130	Red Deer College	TBA
RELIG 364 *The Christian Tradition*	★3	Lec 91 *First class meeting Jan. 4	2nd	M 1830-2130	Red Deer College	TBA
SLAVE LAKE						
ED PSY 515 *Theories of Personality*	★3	Lec 91 *First class meeting Sept. 18-19	1st	F-S 1830-2130	Roland Michener High School	TBA

The University of Alberta

campus map



EA Corbett Hall 74
Clinical Sciences 73
Interns' Residence 72
Butler Building 71
Hospital Laundry 70
University Hospital 69
Wells Pavilion 68
Public Health Laboratory 67
Colonel Mewburn Pavilion 66
University Health Service 65
Campus Tower 64
Medical Sciences 63
Research Council of Alberta 62
Education Centre North and South 61
Household Economics 60
St. Stephen's College 59
Law Centre 58
Fine Arts Centre 57
Campus Security 56
Administration Building 55
Civil-Electrical Engineering 54
Dentistry-Pharmacy Centre 53
Old Power Plant (North) 52
Rutherford Library North and South 51
South Laboratory 50
CAB (Central Academic Building) 49
HUB (Students' Union Housing) 48
Humanities Centre 47
Rutherford House 46
Arts Building 45
Cameron Library 44
Henry Marshall Tory Theatres 43
Henry Marshall Tory Building 42
Greenhouse 41
Agriculture Building 40
Chemistry East and West 39
V Wing 38
Physics Building 37

36 WW Cross Cancer Institute
35 Veterans' Nursing Home
34 Aberhart Sanatorium
33 Aberhart Rehabilitation
32 Aberhart Nurses' Residence
31 Power Plant (South)
30 U of A Nurses' Residence
29 Day Care Centre
28 Mackenzie Hall
27 Henday Hall
26 Kelsey Hall
25 Lister Hall
24 Northern Alberta Jubilee Auditorium
23 St. Joseph's College
22 Physical Education Centre
21 University Hall
20 SUB (Students' Union Building)
19 Art Workshop 1
18 Stadium Carpark
17 Printing Services
16 Pembina Hall
15 General Services
14 Hydraulics Laboratory
13 Structural Engineering Laboratory
12 Athabasca Hall
11 Art Workshop 2
10 Assiniboia Hall
9 Mechanical Engineering
8 Chemical-Mineral Engineering
7 Industrial Arts
6 Windsor Carpark
5 Nuclear Research Centre
4 Art Gallery
3 Faculty Club
2 President's Residence
1 Biological Sciences Centre